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Extension education in Africa, Asia, and Latin America: Perceptions by extension educators and international graduate students of extension education in the United States

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Extension education in Africa, Asia, and Latin America: Perceptions by extension educators and international graduate students of extension education in the United States

by

Ismail Eltigani Mohamed

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TABLE OF CONTENTS

CHAPTER I. INTRODUCTION

There have been frequent prophecies of famine on a global scale since Thomas Malthus first published his essay on population in 1798. So far demographers and scientists echoing Multhus' foreboding have always been proved wrong, but by the beginning of the second half of this century there were ominous signs of a steadily widening gap between supply and demand for food, especially in the Third World (FAO, 1979). In 1979, the Food and Agriculture Organization (FAO) of the United Nations released a report estimating that over 50% more food would need to be grown by the year 2000 to feed the population and diminish hunger and malnutrition (FAO, 1979). Since 1979, many Third World countries, most acutely in Africa, but also in Asia and elsewhere, have experienced years of serious food shortages (FAO, 1984). The situation of some of these countries again deteriorated during 1986/1987, and famine conditions were reported in some regions. Delgado et al. (1987) drew attention to the situation; in this vast land-abundant region with 60-80% of the population involved in food production, over one-fifth of food staples consumed were imported.

Earlier in the 60s and 70s considerable interest arose in elaborating and implementing approaches to development whose distinctive feature was claimed to be its direct focus on improving the living conditions of the weaker sections of the society in the Third World (Krishnaswany, 1981). This interest was prominent among both national and international agencies involved in development policy-making and programming. Although

the labels adopted tended to vary from country to country, from agency to agency, and from time to time, it was possible to identify among the various versions the common theme of alleviation of poverty as the central element of a new approach of developing the rural areas. Judging by the findings from studies undertaken by national and international agencies (ILO, 1977) on trends in rural poverty, there was reason to assume that the actions and policies pursued by these governments so far had little or no impact on the problem of rural poverty and in some cases even contributed to its accentuation in the last two decades (Krishnaswany, 1981). These facts together with the past decade's striking events in the Third World food situation had the effect of re-emphasizing the critical needs for significant shifts in identifying causes of poverty and hunger and in setting priorities for action. While earlier development and food production strategies of both the national governments and the international agencies, such as the Green Revolution, evolved in an era when the problems of poverty and hunger were seen largely as a problem of growing more food, it was recognized that increased food production alone would not overcome rural poverty (Chambers & Ghildyal, 1985). Blanckenburg (1984) claimed that in most Third World countries the rural sector was not adequately equipped to solve the tasks ahead of it. Chambers and Ghildyal (1985) supported the same notion, that famine and food shortages in the Third World resulted much less from shortages of resources to produce food and much more from the lack of the means to utilize the resources. Agriculture and farming are seen as more than simply a collection of crops and animals to which one

can apply this input or that, and expect immediate results. Rather it is a complicated interrelated factors such as soils, plants, animals, implements, workers, other inputs and environmental influences with the strands held and manipulated by the farmers who, given their preferences and aspirations, attempts to produce output from the inputs and technology available to them (CIGAR, 1978).

With all this in mind, in order to gain the success of any agricultural breakthrough of a forward thrust in agriculture in the Third World, it is advisable to "sharpen the instruments that would help prepare affected individuals to accept change" (Raman, 1992). Change is a dependent, demanding, desirable development activity that occurs when experience identifies inadequacies or inappropriateness of existing systems (Raman, 1992). Sofranko (1984) argued that human resistance to new ideas is the real barrier to change. Farmers of the Third World are neither slow to change nor bound by habit or custom (Belloncle, 1989). The author suggested that one of the fundamental causes of the present stagnation of African agriculture is an erroneous assumption that there is a need for close supervision by an agent of change at the farm level to produce the desired change. This implies that the farmer is incapable of adopting the proposed changes on his/her own and that constant pressure must be kept on him/her by the extension agent, who is very quickly regarded more as watchman than adviser (Belloncle, 1989). Barrington and Martin (1988), in their review of several cases of farmers' participation in research in Asia, concluded that, as farmers become familiar with new technology, they are more likely to change other

components of their farming systems in order to exploit technological advantages. The authors emphasized that farmers in the Third World should be persuaded that change is possible, and that they have sufficient knowledge and ability to make change happen. Technological change in agriculture involves invention, assessment, and transfer of technology. This primarily involves change in the agricultural knowledge system, a cognitive process, qualitative in nature, where scientific knowledge is transformed into practical, applicable, adoptive systems that meet the challenge of increased production and productivity (Negal, 1980). An agricultural knowledge system has been defined as the set of concepts, meanings, and skills developed over time by individuals or groups, through process of learning, experimenting, observing, teaching, and communication (Haverkort and Engle, 1987). These processes have been going on for ages, and existing farmers' knowledge at a certain place is the accumulated results of these processes. Farmers' knowledge is the result of social experience, and is location specific; it is a result of the response of populations to environmental conditions (Jarret, 1985). Biggs and Clay (1983) have shown that indigenous farmers' knowledge was a major factor in the development of agricultural technology. Farmers carry out experiments and combine a good knowledge of the environment in which they live with their experiences, their values, and risk perceptions. On this basis, the farming system gives rise to certain agricultural practices that enable the population to survive, change and develop in its area (Farrington and Martin, 1988). The learning-by-doing mode is still a source of innovation in both Third World and Western countries,

but the generation of new technologies based on farmer experience alone is necessarily a limited source of agricultural innovation (Jarret, 1985). With increasing population pressure and with increasing aspirations on the part of many, traditional systems of farming have come to be regarded by many as in need of transformation (Jarret, 1985). To meet these demands, the marrying of traditional practices with formal agricultural science has become necessary (Jarret, 1985). Accordingly, in the Western countries the locus of innovation has shifted from the farm itself to formalized agricultural research and development carried out by both public and private agencies (Negal, 1980). Agricultural production levels and the degree of variation in these levels, the sustainability of agricultural systems, and the distribution of production within the population are functions of the modern scientific knowledge and technology available to populations engaged in agricultural production (Haverkort and Engle, 1987). Knowledge is considered as a farming input, equally as essential as land, capital, and labor (Swanson, 1984). With the acceptance of the premise that agriculture is not merely a technological endeavor but a socio-economic one, and the perception that agriculture and farming are social adaptations for survival (Sofranko, 1984), development activity should focus on providing the rural population with education. This is a process by which the people come together to identify their problems and needs, seek solutions among themselves, mobilize the necessary resources, make use of available modern knowledge and technology and execute a plan of action or learning or both (Compton and McClusky, 1980). The same authors believed that the special role of

development was to educate people to become more receptive to change, and to the fact that outside technical and material help was sometimes necessary.

At this point, a crucial logical question presents itself: who is responsible and what is the best way to facilitate the education of rural people? Kouzekanani (1983) cited three modes of education, forms of learning that have been identified by Coombs and Ahmed (1978), and Compton and McClusky (1980): formal education, informal education and nonformal education. Formal education is in-school teaching and learning with its main objectives being to provide learners with general education such as literacy, basic sciences, literature, and history. Societies use it to socialize children and to provide them with productive skills and attitudes required to deal with later life and work. Informal education usually results from daily experiences and exposure to the environment; in home, in the community, on the job, and in the world at large. Informal education is a life-long process, sometimes referred to as incidental learning or learning through ordinary life and experience. it is the most common education, and relies heavily on the physical and psychological environment of the learner. Nonformal education is carried on outside the formal school setting and is aimed at satisfying the immediate and clearly identified needs of particular people. Like formal learning, nonformal learning is structured and has clearly defined learning objectives. However, unlike much formal education, nonformal education is conducted explicitly to satisfy the immediate and clearly identified learning needs of a particular group. Classes, when held at

all, take place outside formal schooling programs; usually they are short and flexible in terms of time and location, and they use a variety of human and material resources.

Krishnaswany (1981) argued that opportunities for formal learning in rural areas are extremely limited due to endemic poverty in these areas. Coombs and Ahmed (1978) argued that informal education, while rich in culture and tradition, lacks those influences and material resources, such as print and other media, that would add to the general fund of knowledge and skills to promote development. Of the three forms of learning, nonformal education was thought to be the best method to fulfill the educational needs of the rural people.

The role of nonformal education in enhancing productivity and rural social change has long been recognized, and has been given increasing attention in recent years (Maxwell, 1987). Extension education, as a nonformal type of education, has been thought to facilitate rural education for development so that attitudes and practices of its clientele could be improved (Compton and McClusky, 1980). Claar et al. (1983) described extension education as "a special type of problem-solving, action-oriented education that instructs, demonstrates, and motivates--group and masses--within the democratic framework of society." Baker (1984) held the view that extension is education.

The educational function of human resources development for agriculture and rural progress is the essence of extension education (Van Den Ben and Hawkins, 1988). Traditionally, extension education has not been concerned with generating knowledge; this has been done in specialized

research institutions such as research stations, colleges and universities. Instead, it has been seen as "the process by which knowledge is communicated, in a variety of ways, to the farm family" (Oakley and Garforth, 1985). Philosophically, extension education is based on the premise that development of the individual is most important in enhancing the progress of rural people . . . the well-being of rural people and their ability to develop and achieve higher levels of living (Blackburn, 1989). It recognizes the proposition that the intelligence and desire of people who are devoted to tilling the soil and managing the livestock will provide the sustenance to feed and clothe the society in which they live and work.

Today, there is rather unanimous agreement that extension education has an important role to play in the improvement of farming in the Third World countries (Blanckenburg, 1984; Rivera et al., 1989). With the realization that the human factor is one of the most essential factors in the development process, extension education agencies, which have largely educational functions, have come to receive greater recognition than in the past as regards to the indispensable nature of their activities. Their services render direct contact with the masses of farmers and sometimes, especially in remote areas, they are the only direct contact between government and the rural people (Watts, 1984). Highly qualified Extension Services are thought to be needed in the Third World to assist farmers and their families in solving their problems in order to enhance rural development. For Extension Education to meet the challenge and

succeed, a solid performance by its professionals is needed; therefore, their training should be given a high priority (Clark, 1987).

During the past two decades or more, land-grant universities in the United States have been involved in a large number of foreign assistance programs under the auspices of the Agency for International Development (AID) (Matterson, 1978). These programs and projects have been designed to strengthen and enhance agricultural development efforts of Third World nations with emphasis on the research, education, and extension systems in these countries (Matterson, 1978). In addition to that, many Third World countries still, for various reasons, do not have viable educational institutions capable of providing manpower to staff development projects, administrative posts and their educational institutions. Some should not, because of size or location, attempt to develop advanced institutions, and need to rely on the Western countries for high level academic training. In addition to their participation in the academic programs of the United States universities, international students and other scholars participate in a number of nonacademic workshops, seminars, and courses.

A closer look at the number of foreign students at United States colleges and universities shows that it has exceeded 400,000 for the first time (Open Doors, 1991). This all-time high of 407,500 in the 1989-90 academic year represents a 5.6% increase over the previous year's total of 386,900 according to a survey of 2,879 United States post-secondary institutions conducted by the Institute of International Education. The same report indicated that approximately 2.8% of total

student enrollment in institutions of higher education were foreign students. The data of Open Doors (1991) were used to calculate that 78% of foreign students in the United States during 1989-1990 were from the Third World. The breakdown was as shown in Table 1.

Table 1. Number of foreign students enrolled in United States colleges and universities

World Region	1989/1990 Percent	Number
Asia	51.06	208,110
Latin America	11.80	48,090
Africa	6.03	24,576
Middle East	9.16	37,330
Total	78.05	318,106

It is evident that Third World countries have been sending students to the United States to enhance their skills and upgrade their capabilities. These foreign students, a number of whom enrolled in the field of agricultural extension education, need to be provided with appropriate types of learning experiences (Thuemmel et al., 1982).

Statement of the Problem

Increasing population and an ever-quickening race between mankind and the food supply have brought wide recognition of the need for adequate delivery systems for rural development and increasing food production has caused rapid growth and interest in extension education

during the last few years (Van Den Ben and Hawkins, 1988). Third World countries have experienced similar rapid growth, often with assistance from the international community in developing their extension services. Developing a more effective extension system is a common quest in many parts of the world and in particular in the Third World. Today, there is a general recognition that Third World extension systems which have been designed to transfer officially sponsored technologies being promoted by government ministries or commercial firms, have their serious limitations (INTERPAKS, 1984; Moris, 1991). Although many of these countries have tried to improve their extension education organizations by adopting measures such as institutional building, or introducing new extension education methodologies such as the training and visit methodology to extension (T&V), farming systems research extension (FSR and FSR/E), alternatives have dealt mainly with the questions of methods (Moris, 1991). Today, however, alternatives should focus on and relate to more fundamental matters such as the philosophy, mission, and function of the extension education organization, the type of agency established to implement these functions, and the task environment, the resources provided, and linkages to other units within a common process for delivering, adapting, and diffusing new technologies (Claar et al., 1983; Claar, 1984; Moris, 1991).

Moreover, one thing stands out today in viewing the changes in the world, now and into the visible future; all countries are part of an interdependent society. Both national and international agencies involved in development must develop a well-understood rationale for

their involvement in international agricultural development. This rationale must center on the need to train people and develop scientific expertise in all parts of the world. Third World countries have been sending students to the United States to gain new knowledge, learn new skills and adopt new practices to better serve their countries. One problem facing educational institutions in the Western World is the absence of clear identification of the needs, interests, and expectations of their international students. A two-way communication between these students and those who teach them was thought necessary so that their needs, interests, and expectations could become clearer to teachers and vice versa (Thummel et al., 1982; Kouzekanani, 1983).

Purpose of the Study

The purpose of this dissertation research was to gather and document self-reported perceptions of extension educators and international graduate students of extension education in the United States about agricultural extension in Africa, Asia, and Latin America. This study was also designed to document respondents' perceptions for needed study in relation to policies and characteristics of extension organizations outside the United States. These are more universally applicable than organizational structures and procedures that are influenced by local settings and bureaucracies (Claar et al., 1983). The following specific objectives were adopted to provide the focus of the study:

1. describe characteristics of extension educators and international graduate students of extension education studying in the United States.

2. document the perceptions of extension educators and international graduate students regarding selected characteristics and policies of extension organizations outside the United States.
3. document perceptions of extension educators and international graduate students of extension education toward what educational needs of rural people an extension organization ought to fulfill.
4. document perceptions of extension educators and international graduate students toward agricultural extension program processes and practices and some of the training needs of the international graduate students of extension education studying in the United States schools.
5. determine if there were differences between perceptions of extension educators and international graduate students of extension education toward agricultural extension program processes and practices, policies and characteristics of extension organizations outside the United States, educational needs of rural people, and training needs of international graduate students of extension education
6. determine the relationships between characteristics of extension educators and international graduate students and their perceptions of extension education outside the United States.

Definition of Terms

For the purpose of this study, the following definitions were adopted:

Extension education outside the United States: Extension education in countries other than the United States, mainly in Africa, Asia, and Latin America.

Extension Organization: In this study, the term "extension organization" was used as a generic term to apply to any government funded agency responsible for providing the public, especially in the rural areas, with information regarding social, economical, cultural, and human needs of people and then assisting them to utilize the information in order to better the level of living in their communities. Claar et al. (1983) suggested that the most widely used meaning of the term "extension organization" in the international arena is the:

> government functions that extend various services to farmers and administer regulations and maybe even enforce policies related to agriculture. The tasks of extending technology and education are mingled with other functions (Claar et al., 1983, p. 1).

Perception: Interpretive ability. The ability to sensitively and accurately understand the significance of forms, patterns or events, and the ability to assign personal significance to them (Moore, 1970).

Third World countries: This study selected the term "Third World" to refer to countries in Africa (except South Africa), South and Latin America, Middle East, Asia (except Japan), and Oceania (except Australia and New Zealand) (Kouzekanani, 1983). Terms such as "developing," "less developed," and "underdeveloped" were not employed because of their tendency to create false images in the minds of people. Kindervatter (1979) said:

> Developed implies that Western countries have reached an ultimate state of being, and ignores rampant problems within these countries; 'rich' overlooks the pockets of poverty that exist. For other general grouping, 'developing' inaccurately implies that these countries are, in fact, progressing, and 'poor' overlooks the wealth of resources and wealthy families that can be found. In addition, 'less developed' assumes that these countries are generally behind, whereas in a humanistic sense they may, in fact, be ahead of the West (Kindervatter, 1979, pp. 13-14).

International graduate students: International graduate students from Africa, Asia, and Latin America studying in the universities and colleges of the United States.

Policies: Management, administration, or procedures based primarily on temporal and material interest; settled or definite courses or methods adopted and followed by an institution (Webster's New Dictionary, 1990). Policies of the organization are standing plans; guide to the actions or decisions of the people in the organization (Boyle, 1981). Policies of extension organization expressed the means by which selected extension objectives are to be achieved.

Characteristics: Distinguishing qualities, those prominent aspects that make the extension organization what it is.

Assumptions of the Study

In order to identify the target population of the study, the chairpersons of the departments offering graduate programs in extension education in 33 Land Grand universities were contacted (Appendix B). They reported to the researcher, as of Fall 1992, the persons who were the extension educators and international graduate students of extension

education in their respective schools. An assumption was made that the chairpersons provided the researcher with the correct information, thus alleviating any possible frame error.

Limitation of the Study

1. The survey instrument represented a selected list of questions established and reviewed by experts. This instrument might not have represented all the possible perceptions regarding the policies and characteristics of the extension organization in the context of the Third World.

Significance of the Study

Although a number of studies have been done in the various fields of extension and training in the Third World, a systematic survey of situations and problems in larger regions is lacking. This study was designed to provide accurate information about the perceptions of extension educators and international graduate students of extension education in United States' universities toward extension education outside the United States. The results of this study could benefit:

1. Educational institutions in the United States in better understanding the needs, interests, and expectations of their international students.
2. International students of extension education in developing better plans of study that would add to their skills and achieve their educational objectives.

3. Planners/decision-makers in the Third World and in the international development community since this study will reflect the thinking of the future leaders of extension in the Third World nations.

This study was based on an earlier study by Kouzekanani (1983) of the extension education perceptions of educators and Third World graduate students of extension education. This study was needed because of extensive changes that have taken place in extension organizations and educational programs in the last ten years.

Chapter Summary

Everywhere throughout African, Asian, and Latin American nations the majority of the population live in the rural areas and engage in some sort of farming or related activity. Most of the areas in the past years have experienced widespread food shortages. The situation now is even worse. Large development projects and programs launched by governments, which often consumed a large slice of the development budgets, have not made a very significant contribution to agricultural development and the well-being of the populations. Education was thought to be one of the mechanisms by which an agricultural breakthrough in these areas might take place, with nonformal education as the essential approach to be used by extension organization. As such, extension teaches people in their own context and life situations how to assess their own needs and problems and helps them acquire the knowledge and skills required to cope effectively with these needs and problems. In most extension education approaches adopted by Third World governments, there was a lobby on

extension organization to carry out government policies (Moris, 1991). Extension education in the Third World has been seen as technology transfer focusing on communicating information about new varieties and husbandry innovations rather than resolving the real community problems.

The capacity of the extension organization depends to a large degree on the skill of its staff which is mainly determined by their education and experience. This study has the potential for helping to improve education of extension students, especially those from the Third World nations.

CHAPTER II. LITERATURE REVIEW

The purpose of this chapter is to present a summary of the literature related to extension education. The three main parts of the literature review are: the theoretical base for extension education, agricultural extension in a Third World context, and graduate education for extension professionals. A considerable amount of work has been conducted in the following areas that are closely related to extension: sociology, psychology, adult education, learning theory, and social work (Blackburn, 1989). This study is based on theories taken from a wide variety of sources.

The first part of the literature review will present an overview of the theoretical base for extension education. The theories are divided into two sections; the first section deals with knowledge generation, dissemination, and utilization. It reviews five models of knowledge generation and utilization and concludes with a discussion of the relationships among the models and a functional framework for knowledge generation and utilization. The second section deals with learning and adult education theories.

The second main part is a review of agricultural extension in a Third World context. Included are discussion on the use of the model in extension education, educational needs of rural people, and program planning in extension.

The third part considers graduate education for extension professionals. It details numbers of international graduate students in

agricultural extension programs and describes some examples of the current programs.

Theoretical Base for Extension Education

Several areas and disciplines in the social sciences and psychology have made significant contributions to the development of agricultural education extension (Williams, 1991). These include planning for knowledge generation, dissemination, and utilization, and learning and adult education theories. This section will draw from these disciplinary areas to develop a theoretical base for agricultural extension education. The purpose of this theoretical base is to provide guidelines for the study of agricultural extension in the Third World.

Knowledge generation, dissemination, and utilization

Traditional farming systems appear, at least from the point of view of a developed agriculture, to be static. Beyond the fact of a gradual adoption and evaluation of agricultural practices over time, the question of capacity to innovate within the traditional systems arises (Negal, 1980). An acceleration of the rate of growth in agricultural productivity, as the nineteenth century experiences in the western nations have shown, was possible only by separating certain functions from the production sphere (Glaser et al., 1983). In terms of agricultural development efforts everywhere in the world this would mean the establishment of viable institutions that produce and safeguard a stream of new technological knowledge and a flow of industrial inputs. This should be complemented by investment in general education and in production

education for farmers to prepare them to use these resources effectively as a necessary condition for modernizing developing agriculture (Negal, 1980). Researchers, practitioners, and administrators are confronted with a major challenge, namely to seriously consider the application of seemingly relevant, potentially valuable knowledge and exemplary practice in connection with their respective subject fields, and thereby, seek ways to improve methods and operation. In response to this challenge, they are producing an ever-growing literature that attempts to cast light on strategies to facilitate desirable change. Much of the literature on knowledge utilization and change deals with ideas and suggestions for practical application. At the same time, there is indication of a strong interest in seeking underlying principles, often borrowed from related disciplines, on which to base application and to build systematic models of the process of utilization and change (Glaser et al., 1983).

The varying perspectives of a number of academic disciplines were presented in a compilation of articles on utilization of knowledge and change (Randor et al., 1978a). In the concluding article, Kranzberg (1978) described a multi-disciplinary approach as reflecting a desired position (Glaser et al., 1983). Thus, anthropologists and sociologists tended to focus on elements of socio-cultural resistance to change and the interaction of different cultures with one another; economists on investment, labor, capital intensiveness, and resource endowments; psychologists on innovative behavior in organizations and individuals; and historians on inventions and technological advances in a time perspective and within a societal context. In sum, implications were

that management policy, national policy, innovations, and institutions might all be relevant factors for consideration in connection with efforts to introduce innovative characteristics into a system. Five widely cited perspectives on utilization and change were set forth by Havelock (1971) and Sashkin and Associates (1973). Of the following five approaches, the first three are described by Havelock, the last two by Sashkin and Associates:

1. The problem-solver model
2. The research, development, and diffusion model
3. The social interaction model
4. The planned change model
5. The action/research model

The problem-solver model The problem-solver model "stresses collaboration with the client system and diagnosis of the client system's needs as the two essential ingredients of the change process" (Havelock, 1971). The model is a general one and could be applied to a process inside a group, an organization, a community or society as whole. As suggested by this model, the problem-solver may be outside specialists but they will act in a two-way reciprocal and collaborative manner if they are to be effective. To most practitioners and those who work most closely with them, the needs of clients, whether stated, implied or assumed, are the only place to start an analysis of knowledge utilization. This viewpoint is very compatible with the individualistic and humanistic tradition and it finds it expression in terms such as "student-centered curriculum" (McNeil, 1990).

Successive stages in this model generally follow the psychological theory of need reduction through problem-solving. The process was described by Havelock (1971) as a cycle composed of five stages (see Figure 1) beginning with "1a" and concluding with "1b." The fifth stage (application of solution) leads to a reduction of the original need if the solution is right. If it is not right then presumably stage "1a" is reinstated and the cycle is repeated until a solution that is truly need-reducing is discovered.

Glaser et al. (1983) viewed that the outside helper, or change agent, in the problem-solver model, is often non-directive, mainly guiding the potential user through his/her own problem-solving process and encouraging the user to utilize internal resources.

The research, development, and diffusion model This model usually represents those who start from research and the products of research and delineate a path toward the client (Havelock, 1971). This point of view could be characterized by the statement, "If knowledge is there, a user will be found for it." Client needs do not enter the picture as prime motivators for the generation of new knowledge (Havelock, 1971). Research in this model does not begin as a set of answers to specific human problems. Rather, research starts as a set of facts and theories about the nature of the universe, knowledge which can only be made useful to people through an extensive development (Havelock, 1971). In development, basic theories and data are used to generate ideas for useful products and services; these ideas are then turned into prototypes which have to be tested, redesigned, and re-tested before they

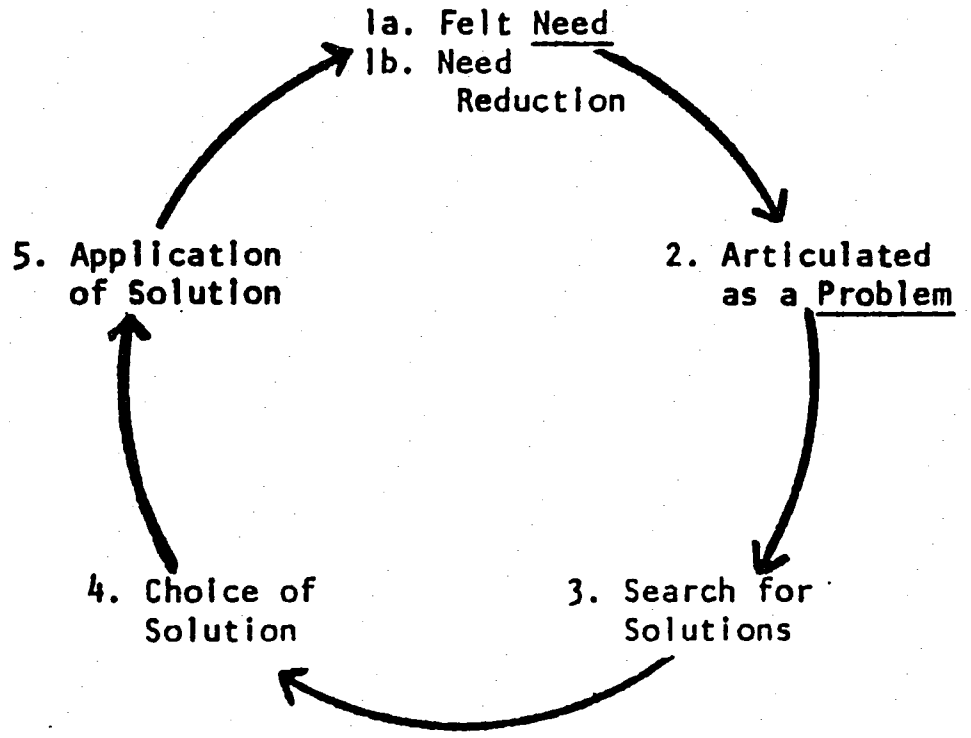

Figure 1. The need reduction cycle (Havelock, 1971, pp. 2-41)

represent anything that is truly useful to the people (Havelock, 1971). Once the knowledge has passed through the development phase it is ready to be mass-produced and diffused to all members of society for whom it might be useful. This model assumes that there is a relatively passive target audience of consumers, who will accept an innovation if it is delivered through a suitable medium, in the right way, at the right time (Glaser et al., 1983).

The social interaction model The social interaction model emphasizes the diffusion aspect, "the measurement of movement of message from person to person and system to system" (Havelock, 1971). This model also stresses the importance of factors such as opinion leadership, personal contact, and social integration and sees the society as "a network of roles and channels of communication with organizational and formal and informal associations forming barriers and overlapping connection (Havelock, 1971).

The planned change model In the planned change perspective, information is considered useful only if it leads to action and is shared between the change agent and the client. The assumption basis for this model is that change occurs through a consciously controlled, sequential, and continuous process of data generation, planning, and implementation (Negal, 1980).

The action/research model The action research perspective, though similar in some respect to the problem-solver and planned change models, is most distinctive in emphasizing the development of research within and by the organization (Negal, 1980). The results of the

research, though intended mainly for the organization itself, may prove useful to others.

Relationships among models Freire (1973) identified the relationship between knowing and the desire to intervene in the world as the key to the motivation for learning. The author observed that when attention was paid to the real problems, a lot of interest was generated among Brazilian illiterates. The author suggested a model of education where mutual respect exists among educators and educatees for each others' knowledge and culture and blossoms into dialogue which itself becomes a creative source of new knowledge. The author drew together many strands of contemporary thinking into a dynamic theory free from dehumanizing oppression. One of the author's most central concepts, 'Conscientization,' is a process by which persons, not as recipients but as active learners, achieve a deep awareness both of the socio-cultural reality that shapes their lives and of their ability to transform that reality (Freire, 1970; 1972; 1973). This means enlightening people about the obstacles that prevent them from having a clear perception of reality. The aim of education and change in Freire's model was not a technique for information transfer; rather it was seen as a dialogical process that brings individuals together to solve common problems (Carmen, 1991). Norman Long (1977), cited in Carmen (1991), distinguished between two fundamentally different approaches to rural planning in the Third World: 'the improvement approach' that aims to encourage agricultural development within existing peasant production systems; and the 'transformation approach,' which attempts to establish new forms of

agricultural and social organization, and which makes a radical break with existing peasant systems in terms of scale, production techniques and sociological structure. Improvement policies rest fundamentally on a modernization view of change, and stress the diffusion of modern technologies, skills, and resources to the 'traditional sector' (Carmen, 1991). Transformation policies attempt to bring about structural change through a radical break with existing systems (Carmen, 1991).

Local and international development programs in the Third World have been initiated by existing government bodies that are specialized agencies; this also is applicable to community-oriented programs like agricultural extension education. Basically these external and internal agencies all follow the same action described by Carmen (1991):

> The normal sequence of events is that a development program should be designed and carried out and consequently instruct professionals (experts) to come up with ideas. After feasibility studies and possibly a testing-out in the field under farm or pilot project, the revised model is handed over to administrators who will direct at the target population their usual bag of tricks: extension, training, education, credits or any other inputs deemed necessary (Carmen, 1991, p. 63).

Freire (1973) demonstrated how the extension model in the Third World nations, in fact, transforms the peasants into a "thing," an "object" of externally initiated and directed change. The conclusion of the discussion presented above suggests that if indeed international development agencies and the local governments of Third World nations have an interest in helping people to develop, attention should be paid to the real problems of people rather than problems of the governments or

international development agencies (Freire, 1973). The strong meaning of the words related to people problems stimulate participation and empowerment. A recent study (Garcia-Zamor, 1985) on the importance of participation started from:

> . . . The assumption that unless the people affected participate directly in planning and management of development projects and programs, these programs will not have a lasting success (Garcia-Zamor, 1985, p. 1).

What has indeed come through very strongly in the last decade is the question of long-term sustainability of whatever program efforts that are oriented toward the people. The appreciation of participation as a valuable addition to the planners' tool-bag has increased forcefully in recent years (Boyle, 1981; Rogers, 1983; Carmen, 1991).

Boyle (1981) in discussing program models identified three models that could be discussed within the framework of the knowledge utilization and change discussed above. Developmental programs were viewed by Boyle (1981) as those programs with primary goals of defining and solving individual, group, or community problems. Similar to what was suggested by Havelock (1971) in the problem-solver model, there was an active involvement of learners in determining the problem or the need and the scope and nature of the program (Boyle, 1981). Although the author viewed that in this model program needs might be recognized, the problem was often not well defined nor were priorities established. Glaser et al. (1983), however, believed that self-initiated and directed change had the firmest motivation and the best prospect for a program being main-

tained. Similar to the research, development, and diffusion perspective of Havelock (1971), Boyle (1981) presented institutional and informational programs which were derived primarily from a body of knowledge, research findings, new laws, and regulations. This "standing by knowledge" is characterized by waiting for recipients and providing answers to requests for information.

Bennett (1989) discussed three extension models that were similar to the knowledge dissemination and utilization perspectives presented by Havelock (1971) and the program models presented by Boyle (1981). These models characterized extension education roles and relationships concerning the generation, transfer, and use of technologies and practice (Bennett, 1989). The first model was the research-transfer model in which extension bases programs for users solely on output of research agencies. The author suggested that, in the event these outputs were not directly applicable to the user, the role of extension might be to conduct any development or adaptive research that was needed to make the output applicable. The second model was the adult education model in which extension based programs on its assessment of needs at the societal, community and individual level as well as on research output. The third model, the interdependency model, encompassed all of extension's major roles in the knowledge dissemination and utilization system as identified by both research-transfer and adult education models.

Similarly, models which best fit the "problem-solver model" category include those by Baker (1984), Dalgaard et al. (1988), and Boone (1985). Models which best fit the "research, development and diffusion model"

include those by Hold (1986) and Lionberger (1986). Models which best fit the "social interaction model" include those developed by Rogers (1983).

From the above discussion, it was evident that various perspectives on knowledge and change were not mutually exclusive and that they displayed similarities and differences. Although the theories of most writers on dissemination and utilization of knowledge and related topics seemed to fall distinctly within one or another of these three orientations, there were not necessarily contradictions among them (Havelock, 1971). Moreover, as services become more and more scientific and as they help the consumers to solve more and more of their problems, they necessarily become more complex and less and less within the performance capacity of a single individual.

With regard to the conceptual problem of designing a paradigm of agricultural knowledge system in the Third World, the perspectives discussed above are not contradictory (Havelock, 1971). The author suggested that in various fields of knowledge the three knowledge perspectives can be put together sensibly to constitute a true knowledge-flow system. Thus, the agricultural knowledge system would neither be solely dependent upon the "research and development" process, nor on a network of "social relationships," but rather on the proper solution of its functional problems (Glaser et al., 1983). Negal (1980) and Rogers (1983) suggested that an agricultural knowledge system was needed to solve six basic functional problems in order to ensure initiation and perpetuation of the process of knowledge flow:

1. identification of knowledge needs at the production level.
2. generation of innovative knowledge.
3. operationalization of knowledge.
4. dissemination of knowledge.
5. utilization of knowledge.
6. evaluation of the experience.

The sequence suggested here can and will change in practice (Negal, 1980; Rogers, 1983). Thus, some sort of evaluation by the farmer will take place before he/she utilizes a particular innovation. Similarly, at any stage of this process, an innovation may be sent back as unfit to serve a specific purpose or disregarded altogether.

Functional framework for knowledge generation and utilization

Figure 2 presented by Havelock (1971) and used by Negal (1980) suggests a typical functional framework for viewing the knowledge dissemination and utilization macrosystem and delineates the different roles and functions of the sub-divisions and the needed linkages within the system. The framework shows the elements of the knowledge dissemination in a much more idealized and functionalized form. It envisages a coordinated transfer and evolution of expert knowledge from research to development to production to practice to consumer. The four major functions are connected by linkage mechanisms. The whole of this functional chain from research to consumer is orchestrated by a governing mechanism that has enough influence on each sub-system to ensure that all will work together to serve a common purpose, the public interest. The basic components of this system were:

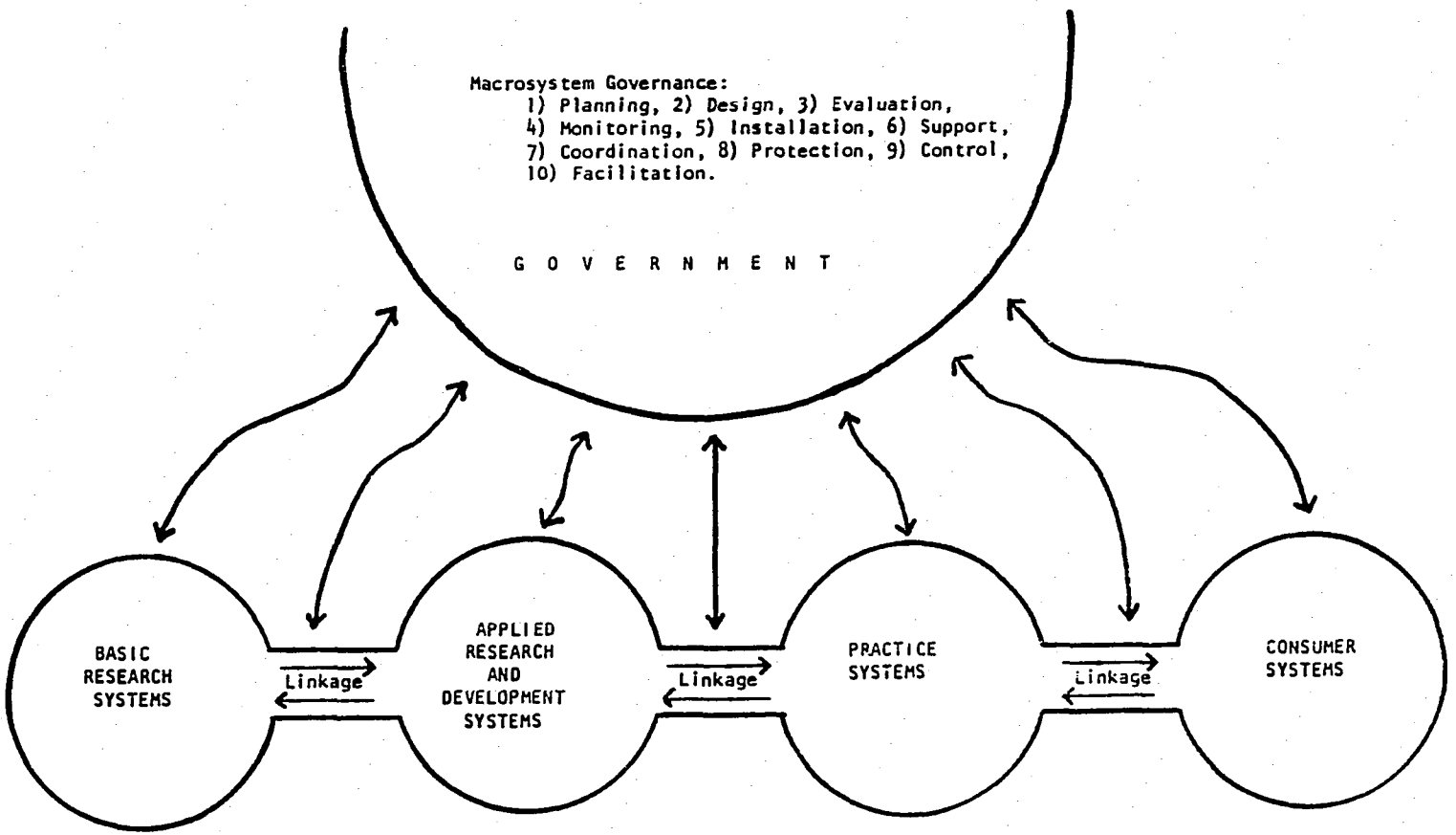

Figure 2. A system model to generate, transform, and distribute information and solve users' problem (Havelock, 1971, pp. 3-8)

1. Generation of knowledge: identical with what is generally termed basic, applied and adaptive research (Havelock, 1971). Traditionally, and particularly in England and Germany, where universities came into being, applied work and service have been shunned altogether (Van Den Ban and Hawkins, 1988). In the more practically minded United States, however, the concept of the university as a center of teaching, research and application came into being with the land-grant college legislation in the 1860s (Prawl et al., 1984). In the Third World, the research wing of the agricultural universities as well as state and central government research institutions constitute this subsystem (Negal, 1980). Discussions of the role of the university and research in the Third World society are almost as old as the university itself. Should the university and research world continue to be the ivory tower that provides intellectuals with a sanctuary wherein they spend their lives sharpening their intellects without any concern with the lesser things of life, or should the university and research world serve the societies that support them? For too long the model of the ivory tower reigned supreme in the Third World (Bhola, 1989). However, the research world and universities of the United States have shown that they can serve both elite and egalitarian interest-intellectual pursuits and practical social ends (Bhola, 1989). The new social role of the university and research world now become unquestioned as the three-fold expectations of the university have emerged: research, teaching, outreach and service (Williams, 1991).

2. Dissemination of knowledge: Negal (1980) viewed the dissemina-

tion function within the agricultural knowledge system as follows:

> Dissemination, as is the case for needs identification, takes place in view of society's defined and accepted goals which pre-structure emphasis and direction of promotional efforts and extension strategies, e.g., determined approaches, clientele, and message content. Within this given framework, the message must be communicated with as little distortion as possible (Negal, 1980, p. 29).

Specific conditions within Third World agriculture account for the fact that to an overwhelming degree the dissemination sub-system is made up of agricultural extension and related governmental services. Their role is limited due to problems of illiteracy, lack of service and commercial infrastructure, and low development of communication structure in general (Rivera et al., 1989).

3. Utilization of knowledge: Negal (1980) said:

> In view of our basic assumption that the agricultural knowledge system is built upon the service function to the farmer, knowledge utilization is a crucial test of whether the overall system is working adequately or not (Negal, 1980, p. 29).

Rogers (1983) in his work on the adoption of innovations indicated that an innovation once utilized is not yet definitely integrated and accepted, as frequent cases of discontinuing show. Hence, stabilizing the adoption of innovation requires successful operationalization, reinforcement as part of the dissemination process, and constant feedback of evaluation results (Negal, 1980; Rogers, 1938). Havelock (1971) agreed that the consumer world is the largest and most important component of the knowledge-flow macrosystem.

The three major sub-systems within the agricultural knowledge system that has been identified are research, dissemination, and utilization or practice. All too often, the theory-practice scale is perceived as a ladder with a top and a bottom, the top represented by the pure research involved in basic science and the bottom by the farmer who does the manual labor (Negal, 1980). A similar differentiation is to be found within the research subsystem itself, where adaptive and applied research are less highly regarded than basic research (Negal, 1980). However, the view here is that all elements play a functional part in the goal attainment at the macro-level. The goal, in this regard, would be the identified needs of the farmers (Hold, 1986). Negal (1980) described the guidance of the system operation through national goals as planning. The author cited McLoughlin (1967) as follows:

> . . . An intimate relationship between research, extension, and planning in tropical Africa . . . All are hampered because the problems of the farmers, seen through the eyes of the farmers, have not been analyzed properly. Research institutions, therefore, have not been directed toward devising innovations which are both technically feasible in terms of the farmer's resources and the physical environment, and economically attractive enough for the farmer to adopt them (McLoughlin, cited in Negal, 1980, p. 39).

Two critical issues in the agricultural knowledge system that are cited by many authors are the place of the dissemination agency and the cooperation between the research and dissemination subsystems. Many controversies have been fought over how this cooperation if not integration ought to be achieved (Havelock, 1971; Negal, 1980; Rogers, 1983).

Variations in the pattern of relationship can be summarized into three models based on Blanckenburg's 1984 review of agricultural extension systems in some African and Asian countries:

> 1. Where the research group controls both research and dissemination functions;
> 2. Where the dissemination group may be in charge of the research function as well; and
> 3. Two groups may independently be responsible for research and dissemination functions (Blanckenburg, 1984).

The same author suggested that the responsibility for dissemination of knowledge may be assigned to:

1. Agricultural colleges which do the research and teach resident students agriculture and courses, or

2. A government agency, commonly a state department of agriculture, which may also render other services to farmers.

Negal (1980) suggested that linking dissemination with an academic institution will strengthen the education component of the subsystem work. With the research and dissemination being under one roof, some authors suggested that it might reduce message distortion in the transfer process (Negal, 1980). Frequent personal contacts allow for the establishment of informal communication channels to supplement the formal agreement (Rogers, 1983). Moreover, in cases where academic institutions are held in high regards, university affiliation may add prestige to dissemination work in the eyes of the farmer--even though its status may be low within the university itself (Negal, 1980). However, Blanckenburg (1984) stressed the fact that the root of most dissemination services in

most Third World nations lies in the agricultural bureaucracy and not in the educational system and this influences not only its organizational framework but also the content of its work. Due to a less developed infrastructure and lack of services, dissemination agencies have had to assume important noneducational functions including delivery of supplies and regulatory activities (Negal, 1980; Claar et al., 1983). A separate section will be devoted to discussion of the dissemination system in the context of the Third World nations. But first learning and adult education theories will be discussed.

Learning and adult education theories

There has, of course, always been the 'education of adults,' as men and women have learned from each other's experience and as collective wisdom has been transferred intra-generationally within cultures and communities. However, 'adult education,' the purposive enterprise pursued systematically as an instrument for human development as well as human resource development is quite recent (Knowles, 1980). Even during its relatively short history, however, the concept of adult education has undergone a tremendously impressive evolution (Bhola, 1989). New definitions of the term 'adult education' have been offered as old ones have been considered inadequate. Bhola (1989) said:

> Naturally the term adult education has come to acquire a whole array of synonyms and near-synonyms, and overlapping and competing terms and labels. Indeed, a discussion of the evolution of the concept of adult education and the fluidity of the field of adult education captures beautifully the social and political ferment of the world today as the underdeveloped parts of the world seek to bring

> development to their down-trodden masses and as developed countries seek to protect their standards of living as well as heal the ravages of over development. The concept of adult education will continue to evolve as new groups of people in need are identified, new educational objectives are discovered, and new methods and techniques for delivery of services become available. The last word has not been said and conceptual and definitional issues have by no means been laid to rest (Bhola, 1989, p. 16-19).

A most profound change of this century has been a change of attitude that regards education as essentially a way of meeting the demands and aspirations of the present period of one's life (Stephens, 1990). Adult education, in our times, has exploded into many different areas of education and training, and has changed societies into schools without walls. it has a particularly critical role to play in a rapidly changing society by providing information and knowledge that people need in order to cope with changing conditions (Knowles, 1980). The explosion is evidenced in the proliferation of programs of education and extension all over the world covering the needs of adult farmers, workers, and women (Hills, 1989). Theoretical needs in adult education are not different from other enterprises and phenomenon. They essentially clarify causal links, correctional patterns and relationships, and enable practitioners to rise above purely pragmatic solutions, and to make reasonable choices among objectives and methods (Bhola, 1989). Theoretical questions in adult education and learning, therefore, include, on one hand, questions regarding the boundaries of the concepts, and the essence of the process, and on the other hand, questions about learner needs and aspirations, teaching methods and materials, learner motivations, and facilitator

training. Other theories have not been developed within the field of adult education, but have been borrowed from the general theories of planning, institutional building, motivation, curriculum development, instructional design, mass media, and research and evaluation (Bhola, 1989).

The concerns here in this section are the questions at the essential core of adult education and learning theory: Can adults learn? What can they learn, at what stage, and under what conditions? What are the adult motivations to learn and how do adults experience and use their learning? Bhola (1989) suggested that a question such as whether adults can learn was a question of utmost theoretical import that would dissipate a myth and give birth to a vast new educational enterprise. The myth was that adults were incapable of learning. Thorndike's work of the 1920s buried that myth once and for all. Over the last 60 years considerable work on the teaching/learning of adults has taken place at the point of intersection of perception theory, motivational theory and learning theory (Bhola, 1989). Adult learning has been found to be associated with factors such as physical health, mental state, social class, formal education, the kind of occupation the person has performed in life, and personality (Knox, 1977).

Much of the theoretical speculation in adult learning has been inspired by the differences between children and adults as learners in terms of needs, abilities, motivations and methods (Knowles, 1980). Children as learners are often captive audiences with only exterior motivation for learning (Knowles, 1980). Within schools their process of

formation is graded and continued as they follow a "standard educational menu" (Bhola, 1989). Adults as learners have been found to be noncaptive audiences and to have inherent motivations (Knowles, 1980). The adult world is a world of action (Knowles, 1980).

The interface between a theory of life-long education and a theory of life-span development may have been the most important theoretical contribution in recent years in adult education. The work of Erikson in the 1950s and Buhler in the 1960s on psychological task categories, and the work of Maslow (1968) on biological needs, security, love, belongingness, creativity and self-actualization seem to have been accepted and to have had far-reaching implications within adult education practices (Bhola, 1989). Two other theoretical traditions that have moved toward becoming part of the essential theory of adult education are needs assessment (Havighurst, 1956; Bhola, 1979; Knoll, 1985) and group process theory (Bergevin and McKinley, 1967). There is a considerable preoccupation among adult educators with the need to discover adults' real learning needs; and then to enable adults to come into groups to solve problems of learning and social action (Bhola, 1989).

Simpson (1986) classified the available body of adult education teaching/learning theories into three categories. His first category was theories based on adult education characteristics. Andragogy, especially in the sense of Knowles (1980) and Cross (1981), is also a theory of learner characteristics (Bhola, 1989). The andragogic tradition builds upon adults' self-dependence and self-realization, experience within a diversity of social roles, intentional goals and readiness to learn, and

orientation not for future preparation but for immediate application (Knowles, 1980). According to Krajnc (1985), andragogy is a wider theory that, in addition, considers adult education's flexibility, and its dynamic nature, and seeks to integrate adult education with adults' social roles, recognizes goal orientation, provides for active engagement of adults and permits a voluntary choice of learning methods (Krajnc, 1985).

The second category consisted of theories based on adult life situations. While these theories talk about life situations, they are still preoccupied, however, indirectly, with adult characteristics (Bhola, 1989). Two theories discussed by Simpson (1986) are McClusky's 'margin of life theory' (McClusky, 1974) and Knox's "proficiency theory" (Knox, 1977).

McClusky's (1974) writing conceptualized adult education according to life situations in adulthood. According to the author, adults possessed a particular level of energy that is divided between the "need to acquire knowledge" and the "need to participate in life situations." The margin of power enabled individual adults to seed education in one situation and not in another.

According to Knox (1977), adult education came as a result of the discrepancy between current and desired proficiency in major social roles. "Social expectations" empower the person to search for more knowledge, better proficiency, and more suitable performance. The needs for knowledge are developed in life situations and in communications between individuals and the social group.

The third category was theories based on change in social consciousness. The roots of the theories of change in consciousness lie in Berger and Luckmann's work (1967) with the social construction of reality, and the work of Habermas (1971) and Mezirow (1981) on "perspective transformation." The crux of this theoretical tradition is that new knowledge is not an addition, but integrates and transforms the perspective and touches the whole structure of awareness of an adult (Freire, 1973). The most popular if not the most important work in this tradition is Freire's (1970) Pedagogy of the oppressed. This theory of adult education is based on the educational encounter between adult learners and a facilitator (McNeil, 1990). The encounter should be dialogic, a transaction between the two identities, rather than a transfer from one to another (Freire, 1970). The aim should be "conscientization," and creation of critical awareness in adults so that the individual can engage in the human vocation of reflection on reality and acting to transform it (Freire, 1970). The author's theory of critical awareness connects adult education with advocacy, giving adult education the central role in empowering the powerless (Bhola, 1989; Carmen, 1991).

Krajnc (1985) claimed that andragogy as developed by Knowles (1980) was a complete comprehensive theory of adult education. The theory uses an andragogical cycle that involves: (a) identification and analysis of educational needs; (b) identification and selection of program content to achieve goals; (c) organization of the program format; (d) implementation of the program; and (e) evaluation of the program process and outcomes. Knowles (1980) contributed a technology of andragogy consisting of: (a)

establishing a good learning climate, both physical and social; (b) diagnosis of needs; (c) conducting learning experiences; (d) the planning process; and (e) evaluation of learning, particularly self-evaluation.

A complete theory of adult education should enable the adult educator to make policy and pedagogy connections and enable adult education workers to develop a course of study and a course of action (Freire, 1973). Such a model should be, first and foremost, systematic, and dialectic to be able to reflect the political nature of human decisions in relation to the distribution of educational goods within the society. The most important new theoretical development in the area of policy, planning and programming in adult education may have been that these processes are not technical but socio-technical processes (Bhola, 1988). Policy is not knowledge-driven; knowledge becomes part of the politics of policy formation (Bhola, 1988). Adult education policies are not imposed but orchestrated (Bhola, 1988). Rather than formal enunciation of a national policy, direction may be provided through the exercise of leadership and sometimes through material incentives to those who would be willing to implement particular initiatives (Bhola, 1988). The essential process involved in organizing adult education programs is to invent a set of roles and a set of rules for interrelating those roles, and to perform specific tasks for achieving particular objectives (Knowles, 1980).

All through the history of adult education, curriculum and content have taken priority. It is through the curricula that adult education ultimately becomes reality (Knowles, 1980). Adult educators who work

directly with adults or close to them in designing and delivering programs express their values and make their choices concretely through the choice of content (Knowles, 1980). Conducting adult education means distribution of educational goods and, when it is well done, involves empowering people (Freire, 1973). Since adult education is a political act, at the most general level of theorizing, adult education curriculum models have to be political models (Freire, 1973).

The essential adult education curriculum, of course, is not all thinking skills; it includes human skills as well that are rooted in values such as freedom, equity, progress, and peace (Beyer, 1987; Bhola, 1989). Another way of conceptualizing adult education content would be to select content that assists adults in making nature and society transparent to themselves, and to acquire both "social consciousness" and "scientific consciousness" (Freire, 1973). Many scholars suggest that adults must be taught skills to participate in the economic, social, and political institutions of the society (Freire, 1973; Bhola, 1989).

The terrain of adult education is marked by many and varied organizational forms and institutions: from the international to the local; from the state-controlled to the voluntary; from the academic to the action-oriented; from the confrontational to the therapeutic (Knowles, 1980). It should not be surprising that adult education has been organized so differently in different political cultures and countries (Bhola, 1989). At the same time the borrowing of institutional forms across cultures and countries is quite remarkable. One important contribution that has spread all over the world is the United States

Cooperative Extension service model (CES), which was established within the land-grant universities in 1914 (Knowles, 1980; Bhola, 1989; Moris, 1991).

Agricultural Extension Education: Third World Context

The preceding general theoretical discussion of the knowledge generation, dissemination, and utilization set forth the proposition that agricultural development, in the broader sense, depends upon a system of related functions (Havelock, 1971; Axinn and Thorat, 1972; Negal, 1980; Rogers, 1983). Agricultural extension, which is an integral part of this system, is primarily concerned with transmitting information and knowledge about improved agricultural technology from research to farmers (Havelock, 1971; Negal, 1980). There is no doubt that farmer-to-farmer dissemination of agricultural knowledge is important (Rogers, 1983); but agricultural extension is essential to accelerate this process and make sure that appropriate and validated technology is being disseminated (Swanson, 1989). Van den Ban (1982) argued that the destiny of rural people in low income countries will be influenced considerably by the way in which rural extension will fulfill its tasks. This can even have considerable influence on the food supply for the urban population (Van den Ban, 1982).

This study has adopted the term "Third World countries," to refer to countries in Africa, Asia, and Latin America. Because these countries are on quite varying levels of economic, social, and organizational development, agricultural extension education in this context has to face

a variety of situational factors including the political situation, historical factors, technological level, rural structure, level of education and economic policy framework (Blanckenburg, 1984). Because of these situational factors, there are dangers inherent in offering specific recommendations for the organization and operation of agricultural extension organizations in any particular region. Therefore, the reader is urged to work out his/her own application of useful perceptions adapting them to existing circumstances. For the purpose of this research, the key point is that, even with this great variation in situational factors, each nation has some kind of arrangement for carrying out its education/extension function. If each extension education system is carrying on an appropriate program for its own conditions, the actual activities making up that program will be very different from country to country (Axinn and Thorat, 1972).

Policies and characteristics

Axinn and Thorat (1972) in their concluding chapter of the comparative study of agricultural extension education in twelve countries in Africa, Asia, Latin America, Australia, Europe, and the United States in 1973, said:

> Agricultural extension education systems tend to vary from place to place around the world, and yet certain commonalities are found in all of them. . . . Extension education systems vary more in form than in function. . . . To summarize these comparisons, the striking characteristic appears to be the similarities among agricultural extension education systems rather than the differences between them. This is, even in rural social systems that differ

> greatly in terms of the kinds of technologies employed, the level of living, the degree of specialization in various organizational configurations and the nature of agriculture being practiced, there are great similarities in the organizations that carry out agricultural extension education. They tend to have similar doctrines, although their organizations are structured differently. Programs have different goals and objectives but feature similar methodology (Axinn and Thorat, 1972, p. 184).

By the early 1970s, there had been sufficient exchange on a world-wide basis among professional agriculturists concerned with the extension education function that the similarities tended to overweigh the differences, particularly with respect to the functional linkage (Axinn and Thorat, 1972). The same two authors submitted twenty-nine generalizations that they believed might be considered to be "principles of human behavior as they relate to agricultural extension education" (Axinn and Thorat, 1972, p. 189). The authors suggested that these generalizations could be helpful whenever human beings had the task of bringing useful and practical information to others in agricultural extension education context. Of these hypotheses, the following were deemed appropriate for the conduct of this research study:

> 1. Farmers are likely to adopt the practices recommended by the field staff of an agricultural extension education organization directly to the extent that the services and supplies required as input (in order that recommended practices be adopted) are supplied either as part of or in close association with the information they receive.
>
> 2. The extent to which goals of any agricultural extension education program will be achieved tends to be directly related to the extent to which they are clearly understood by those responsible for carrying out the program.

> 3. The extent to which the goals of any agricultural extension education program will be achieved tends to be directly related to the extent to which those toward whom the program is directed have participated (possibly through representatives) in establishing these goals (Axinn and Thorat, 1972, p. 189-192).

Prawl et al. (1984) in discussing extension activities around the world said:

> Many critics of technical assistance point out that an extension service as a system cannot be uprooted from one country and planted in another. Social, political and cultural differences make transplanting an extension service as it is known in the United States a difficult endeavor. In the 1950s, some attempts to do so met with failure. What was learned from this, however, is still significant. The sound, basic ideas of extension education are being adopted throughout the world but in the context of each country's specific heritage and customs. What are these basic ideas? They include a strong responsive institutional base, the problem-solving approach, and involvement of local officials and leaders in planning and implementing of extension program and activities (Prawl et al., 1984, p. 158).

Claar et al. (1983) in their paper, "The Cooperative Extension Service: An adaptable model for developing countries" supported the notion that "principles, concepts and methods of agricultural extension education are more universally applicable than procedures which are influenced by local, bureaucratic methods and can vary widely" (Claar et al., 1983, p. 1). The authors believed that agricultural extension education programs that rely heavily on participation and action on part of the learners can operate under basic principles, even though procedures are not the same in different countries. The same authors listed

several components that they believed to be universally applicable for an effective extension service. These include:

> 1. A mission or charge to the extension service should make clear what it is expected to do, who it is to serve, how it is to be evaluated. The inclusion of some basic philosophy to undergird or support the system that is chosen may be helpful in providing continuity and stability. Financial input at the local level is desirable. Among other things, it increases the interest in extension service at the local level and heightens the expectations of it.
>
> 2. The extension organization must establish and maintain a clientele-central approach in order to effectively bring about change. Of course, the results of extension work will usually parallel national goals. But it sometimes occurs that the best decision for a single farm family or group of families may not fit precisely into national goals. The extension service needs the freedom to assist families with their choices as long as they select their approaches on a sound basis. Basing extension in a university, or other such unit which is perceived as an objective setting, can be an effective means of establishing clientele trust and support. Where it is impractical or not acceptable to put extension in a non-governmental unit, the extension unit should be set up within the government with primary educational functions and freedom to work with the relevant government ministries in an educational rather than a directive or regulatory role.
>
> 3. Non-educational assignments to extension and its agents tend to overshadow the educational functions and may seriously weaken the principal educational purposes for which the unit was established. Because extension is frequently one of the few units that reaches the local level in all regions, there is a great temptation to assign them a wide variety of duties, such as settling disputes, collecting payments for government services, . . . etc. These supplemental assignments may become dominant both in time spent and in setting the image of an agent locally. The problem solving role of the local agent is so important that it must not be hazarded by conflicting roles.
>
> 4. The quality of a project will be enhanced and its acceptance abetted if there is direct guidance from leaders of the target audiences. Extension programs should be strongly oriented toward helping clientele solve problems,

> and that implies a high level of involvement on the part of the people served. Some problems may be of such magnitude they are recognized at the national level; others may be only recognized by an individual client. Through his mechanism, clientele become involved in helping develop extension programs and in keeping the program oriented to local concerns (Claar et al., 1983, p. 12-13).

Claar (1984) believed that efforts to improve extension systems in many Third World nations have frequently not addressed many basic weaknesses such as organization and structure; instead they have emphasized such things as vehicles, equipment, training, and techniques. The author argued that the reasons for that may be that if the system could be significantly improved by dealing with such tangible problems, the results would be quickly felt, and more costly, time consuming, difficult problems could be avoided.

Maunder (1972) suggested the following among the elements that are conducive to the development and continuing effectiveness of extension education:

> 1. A national policy embodied in legislation establishing the educational role of the extension service and the relationship of extension education to other elements of agriculture and rural development.
>
> 2. A philosophy of extension education embodying the concept of human resource development as a major goal (Maunder, 1972, p. 9).

The fact of differing extension systems attests to the variety and complexity of extension, and suggests that extension may be interpreted in different ways (Rivera, 1991). While it is recognized that alternative systems of agricultural extension exist (Axinn, 1988; Rivera, 1985)

and that extension development should be based on the principle of situation specificity (World Bank, 1990a), the issue of whether agricultural extension remains educational or a governmental policy instrument continues to be a major controversy, raising both political and technical issues. Beal (1989) describes how attempts to transfer the United States land-grant university extension model to the Third World have often resulted in only limited success or in failure. Is the World Bank's Training and Visit (T&V) extension model the right choice? The Farming System Research and Extension (FSR/E) approach raises other questions such as, should extension be a freestanding institution providing information to farmers about the entire agriculture development process? (Rivera, 1991). Or, should it be a component of farming system research projects and essentially serve to transfer only adaptive technology? (Rivera, 1991). The agricultural extension roles/functions debate involves serious concerns and raises new questions (Claar, 1984). For instance, what should agricultural extension deliver as service or products? How should it be interfaced within the totality of the agricultural development system? Should agricultural extension be a top-down or bottom-up process? And new questions continue to arise.

A careful review of the history of agricultural extension education reveals that the "extension" idea of applying knowledge to human use is as old as the Renaissance and the rise of science. Putting the idea into an organization with all its accouterments for some public purpose took a bit longer, and much happened in between. "Possibly, the first modern, agricultural advising and instructional service was established in

Ireland during the great potato famine in the mid-nineteenth century" writes professor Gwyn Jones (1984, p. 2) of the University of Reading, England. "It began as a pilot scheme in 1847, with ten instructors to move in circuits among the areas worst affected by potato blight. It was expanded to a peak of thirty-one instructors and continued for four years" (Jones, 1984, p. 2). The monumental problem-solving challenge came from the catastrophic social effect of the potato blight during the last half of the 1840s. In the United States, agricultural societies were also flourishing, lectures were being given to assembled farmers, letters suggesting improvements were being circulated, and governors, legislators, and colleges were proposing agricultural curricula (Claar et al., 1983). While this could be found in some degree before 1845, after this date the country produced something more organized, more comprehensive, and more clearly targeted (INTERPAKS, 1984). Claar et al. (1983) discussing the evolution of the United States Cooperative Extension system said:

> . . . Opportunities for formal learning in agriculture were extremely limited in early America. . . . However, the awakening of science wasn't to be denied. Agitation for agricultural and other practical education spread, and a few states even established state universities. Finally, in 1857, Vermont Congressman Justin Smith Morrill introduced a land-grant college bill. Not until five years later, however, did the bill finally win approval when Abraham Lincoln signed it in 1862. Only a few weeks before signing the land-grant act, Lincoln signed another historic and equally important bill that established the United States Department of Agriculture (USDA). . . . Establishment of agricultural experimental stations in 1887 was another milestone in the developmental process that ultimately led to extension's emergence. . . . As extension-type work increased and flourished, it became

> readily apparent that greater federal support was needed. In 1914, the Smith-Lever Bill was passed and the Cooperative Extension Service was born (Claar et al., 1983, p. 3-4).

Extension education became the largest problem-solving educational system in the world. It was a particular type of non-educational innovation and its purpose was to take the educational advantages of the university to the people at large where they lived and worked (Singh, 1983; Maxwell, 1987). It was precisely a university-extension movement and gradually spread to other institutions in the United Kingdom and United States. In due course and in conjunction with the United States technical aid program, the term extension education and its philosophy with modifications was extended from the United States to many Third World nations in Africa, Asia, Latin America, and elsewhere. Detailed studies of how, when, where, and why present extension programs came into being led some scholars to the formulation of some broad operational definitions. According to Maunder (1972), Swanson (1984), and Claar et al. (1983), extension, in it broad sense, was defined as the extending of, or a service or system which extends, the educational advantages of an institution to persons unable to avail themselves of them in a normal manner. In other words, all forms of extension took education to the people (Claar et al., 1983; Maxwell, 1987). The terms "extension" and "extension education" were considered synonymous by many authors (Maunder, 1972). "Agricultural extension" took to the rural people that form of education assistance best suited to their needs (Claar et al., 1983). Maunder (1972) defined agricultural extension as a "service or system

which assists farm people, through education procedures, in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living, and lifting the social and educational standards of rural life" (Maunder, 1972, p. 3). The above definition is quite broad. It includes the whole environment in which a farmer lives and operates as a legitimate field for extension activity. The concept that the broader function of extension work is to help people to solve their own problems through the application of scientific knowledge is now generally accepted. If this be true, then extension must be regarded as largely educational (Maunder, 1972; Claar et al., 1983). All definitions of extension involve changes; changes in behaviors of rural people presumably resulting in improved agricultural production, better living, and strengthening of the national economy. But fundamental to any permanent behavioral change is that of attitude (Maunder, 1972). In order to change the behavior of many people, extension education must first change their attitudes toward change (Raman, 1992). To bring about a change in attitudes is a basic educational function of extension education (Maunder, 1972). The literature review revealed that the concept of agricultural extension varies in respect to relative emphasis on education, service, operation, and programs. Service rather than education was justified according to Savile (1953) and Maunder (1972) when the national interest required immediate action on a broad scale; however, since this did not occur all the time, an educational role seemed to be more appropriate for agricultural extension. Lowdermilk (1985) provided a summary of 16 lessons that

were learned from the past 30 years of agricultural extension experience in the Third World. Among them the following were listed:

> 1. Extension works better as an educational process without regulatory duties or use of compulsion.
>
> 2. Education that helps farmers to identify and solve problems, acquire confidence in their skills and their government programs, and gain freedom in decision-making is more effective in the long-range than simply using extension as a distributive mechanism for research results (Lowdermilk, 1985, p. 2).

In the Western industrialized countries, where agricultural extension first appeared, the principle has long been adopted that agricultural extension organization's first task is to assist the farmers and their interests, but not to carry government plans into effect (Blanckenburg, 1982). Many governments in the Third World tended to treat agricultural extension as a state agency to execute government plans (Maunder, 1972; Swanson, 1984). The development of agricultural extension in the Third World nations was, to a very great extent, a post-independence phenomenon, occurring mainly after the mid-1950s, with a few established in the late 1940s and others initiated in the early 1960s and 1970s (Swanson and Rassi, 1982). It must be noted, however, that agricultural extension in many of these countries was relatively young and evolved out of a different historical experience than those in the Western nations (Swanson, 1984). Extension-type activities were usually associated with commodity improvement schemes and evolved from the colonial "advisory service;" which resulted from the colonial government's sponsorships of research on export crops, because they were interested in increasing the

export of these crops (Swanson, 1984; Seepersad, 1985). Research and extension activity on traditional food crops, however, was seldom given any attention in these countries and the trend continues. Seepersad (1985) among others, has discussed the implication of that policy:

> In countries that were former British colonies, extension organizations emerged out of the colonial advisory service which pursued different goals from those implicitly or explicitly espoused by current extension approaches. Planning was essentially a top-down process, emphasizing the goal for increasing agricultural production, especially in export crops. Current approaches stress the development of the people as an important goal, and thus, the involvement of the client is essential. As a result of the above circumstances, many extension organizations still retain vestiges of the advisory-service philosophy and approach to extension programming. Extension education in many Third World countries performs a wide array of functions, many of which are not educational in nature: what are many times considered educational programs really consist of traditional types of programs and activities in planning and conducting extension work . . . . Many developing countries lack clear statements of agricultural policy and extension's mission and philosophy (Seepersad, 1985, p. 103-104).

The existence of agricultural extension within the agricultural development bureaucracy and not the educational systems in most Third World countries (Negal, 1980) characterizes not only the formal organization framework of many extension services, but also the content of their work (Blanckenburg, 1984). Purely educational activities have been the exception rather than the rule (Negal, 1980). The author said:

> Though this may seem dysfunctional from the educational point of view, there are strong arguments in favor of such a solution at early stages of development. Of all government agencies, the agricultural extension organizations are often the only ones reaching down to the village

> level. Messages as well as material goods have to be passed through extension if they are to get to villagers at all. Secondly, combining supply and educational activities may add some degree of realism to extension programs. Credits, seeds, fertilizers may be used as reinforcements in the adoption process and vice versa (Negal, 1980, p. 49).

Rivera (1991) said:

> Extension tended to lose its sense of mission. As one of the few government institutions with a broad coverage of the rural areas, extension agencies were increasingly called upon to play a wide range of political, administrative and development roles, which often had little to do with their original mandates (Rivera, 1991, p. 104).

Axinn and Thorat (1972) came to the same conclusion that in many developing nations, the government was the only organization capable of supplying the production component with the inputs it needed and the marketing component with its outputs, as well as carrying out research, extension/education, and governance. It is a fact that most of the Third World nations have inherited their systems of administration from the countries of which they were formerly colonies (Seppersad, 1985). They did not begin with a blank sheet. The structures they built and continued to build were fashioned after models they did not choose (Seepersad, 1985). The lamentable situation in most of these nations was that agricultural extension organizations were responsible for the distribution of credits and other inputs among farmers, and, in the process, neglected their educational duties (Claar et al., 1983; Claar, 1984). This gave them a different type of power over the farmers (Van den Ban and Hawkins, 1988). it offered other opportunities to persuade farmers

to change in the direction considered desirable by the government (Moris, 1991). The same author said:

> In order to promote national earnings of foreign exchange, some of the Third World countries find themselves promoting crops which are not longer attractive to farmers. Indeed, on some of Africa's largest irrigated schemes, tenants have been forced to produce the official crop even at a loss (Moris, 1991, p. 152).

Maintaining a solely educational role seemed helpful to agricultural extension, enabling it to focus more on responding to the actual needs of the rural masses rather than enforcing government policy, and hence to concentrate on food crop production which was one of the top needs of rural people (Claar, 1984; Lowdermilk, 1985). However, the ideas that agricultural extension was a way to educate farmers and that it was an instrument of government policy were not in disagreement (Van den Ban, 1982).

Axinn and Thorat (1972) stressed the importance of the relationship between extension systems and the organizations that sponsored it. The authors made an attempt to relate program control to the participation of clients and noted the tendency for more program control by farmers when farmers' associations were major sponsors. Conversely, there tended to be a greater degree of program control on the part of the sponsor when the sponsor was the central government. Structure also was related to sponsorship (Axinn and Thorat, 1972). The authors found that when the government was the main sponsor, the structure tended to be patterned after other government units, and extension personnel tended to be fitted

into usual ministry establishments or civil service categories. The two authors also pointed out that when agricultural extension programs were relatively successful, there was a gradual build-up of obligations of one sort or another on the part of clients. In response, those served by such programs tended to place a higher value on the organization, and it became acceptable among the clientele to support the organization.

Beal (1989), discussing adaptability of the United States extension model to the Third World, pointed out that there has always been a concern, though perhaps not enough, with where extension was placed or interfaced (e.g., university, government, community development). Swanson (1984) and Van den Ban and Hawkins (1988) observed that in most of the Third World nations extension services were part of a larger organization, normally a Ministry or Department of Agriculture. Agricultural extension was one of the main policy instruments in these countries and the people in charge of a national program for agricultural development could only carry their responsibilities effectively if they could control instruments like agricultural extension (Van den Ban and Hawkins, 1988). The two authors said:

> The goals of agricultural development programs are national goals, but national goals do not always coincide with those of all farmers. Political leaders and managers of Department of Agriculture do not always realize that extension is only a suitable policy instrument if both goals are in agreement. Therefore, extension agents in several countries are expected to achieve targets which are not in the best interest of many individual farmers. Naturally, this makes it difficult for them to gain and maintain farmers' trust (Van den Ban and Hawkins, 1988, p. 275).

Because agricultural research was another policy instrument of the Ministry/Department of Agriculture, and might be organized in applied research institutions (Van den Ban and Hawkins, 1988), there were limited possibilities for university-based research in this structure, and university staff might not have much contact with field problems (Van den Ban and Hawkins, 1988). Not only that, but also the Ministry/Department of Agriculture use of university basic research and development was not always well organized (Van den Ban and Hawkins, 1988). Swanson (1984) observed that where extension workers served as the agricultural representatives of government at the local level, they were largely low-level administrators rather than educators. These types of non-extension assignments usually resulted in serious conflicts for field-level personnel to the detriment of the extension function (Swanson, 1984). Therefore, the extension organization effectively failed to carry out the essential educational and communication functions that were necessary for agricultural development (Swanson, 1989). From the outset, agricultural universities needed to engage in an extension effort, at least for the benefit of their own programs (Van den Ban and Hawkins, 1988). In the United States, this was possible because the land-grant institutions preceded by several decades the establishment of agricultural extension work (Hannah, 1980). It was logical, therefore, for the legislators to add it to the function of institutions that had already established themselves in the field of agriculture, education, and research. In contrast, at the time that agricultural universities were established in most of the Third World nations, agricultural extension programs of one kind or another already existed (Hannah, 1980). So it was natural that

the question should arise regarding the role of an agricultural university with respect to these programs. Though opinions have varied from advocating a complete take-over to letting the extension programs remain as they were, no one seriously challenged the necessity of the new university becoming involved in some way with extension activity (Hannah, 1980).

Should agricultural extension be a top-down or a bottom-up process? Should the educated people and the high-level government officials tell the rural people what is good for them and for their society? Or should the rural people themselves say what their problems are, ask for help from the extension professionals to find solutions for these problems and then decide what the best solution is? It was not long before the top-down approach began to come under criticism (Claar et al., 1983). Proponents of the top-down approaches stressed that researchers could not accurately identify small farmers' problems without new diagnostic methodologies and greater interaction with farmers and extension (Rivera, 1991). They felt researchers should do more to take advantage of the accumulated knowledge of farmers and extension workers at the local environment and farming systems (Richards, 1985). Van den Ban (1982) viewed that the main source which was underutilized in many Third World countries was the intelligence of the rural people. Although they might not have a high level of education, quite a number of them were intelligent. The author believed that the development process should be more a bottom-up process than it is now in many countries, but that at the same time the expertise of trained servants should be used effectively.

Traditional diffusion theory came under attack for not recognizing the special technological needs of different farmer groups (Rivera, 1991). Some scholars like Freire even went so far as to reject the concept of extension, which for them implied a one-way transfer of information. Instead, they called for a more interactive dialogue with farmers (Freire, 1973).

Claar (1990) believed that top-down management and decision-making generally resulted in an ineffective extension system. In both programs and operations, such systems were characterized by decisions made by a few people at the top (Claar, 1990). The author argued that extension systems were different from many functions of government. They were educational and advisory rather than regulatory, with no sanctions or authority to bring actions into line with advice. Thus, a client-oriented approach was preferred (Claar, 1990). Top-down management tended to focus on national concerns, sometimes even government-made national plans (Moris, 1991). In contrast, "one size does not fit all," since each farm family was an independent decision-making unit (Rogers, 1983). Instead, priorities and program content of agricultural extension needed to be geared to local attitudes and situations (Claar, 1990).

Rogers (1983) found that the amount of extension agent contact was the most important factor explaining the rate of adoption, and the most effective extension agents were those who had a problem-oriented or client-centered approach. Axinn and Thorat (1972) suggested the generalization that the rate of adoption would be in direct proportion to the amount of involvement that the farmers had in determining program

objectives. The acceptance of these points would have a powerful effect on how extension units were organized and operated. This stressed that extension was, in the end, a human development process (Claar, 1985).

Yet, in spite of these facts, many extension services in the Third World had little involvement with the client in programming and presented a distinctively top-down authoritarian approach in transferring information (Seeparsad, 1985). In this setting, farmers were likely to continue with their old ways after listening to what extension agents recommended (Claar, 1985). Changing from a top-down to a more bottom-up style, though not easy, fostered acceptance of responsibility through incentives and provided for local programming through involvement and interaction with the client (Claar, 1990). Many scholars claimed that farmer participation was a basic principle of successful extension work (Claar, 1984; Moris, 1991; Rivera, 1991). Others went even farther and suggested that extension program should be "farmer-led" and that the concept of "farmer-first and last" had come into prominence (Chambers et al., 1989).

Educational needs of rural people

Adult education, though difficult to define because it is found in different forms in many parts of the world, is considered to be a major means of developing human resources to more effectively match what seems to be an avalanche of technological improvement (Williams, 1977). Adult education provides organized learning for men and women who wish to improve themselves and their communities. It is designed to help people to understand and adjust to daily economic, social, and cultural changes

and development (Williams, 1977). Because of the importance of agriculture in economic development of many countries, the narrow base of education and wide-spread illiteracy in these countries and the rapid rate of technological change in agriculture, there was a strong case for the establishment of effective adult education systems for rural people engaged in agriculture, in other words, agricultural extension services (Williams, 1977).

Central to the philosophy of extension education is the premise that agricultural extension is a type of nonformal education charged with changing the attitude and practices of rural people, advocating learning by doing, enhancing the development of the people, and advancing the economic well-being of the people as a whole (Blackburn, 1989). Coombs and Ahmed (1978) identified the following as learning needs of rural people directly engaged in agriculture:

> 1. Farm planning and management; rational decision-making; record keeping; cost and revenue computations, use of credit.
>
> 2. Application of new inputs, varieties, improved farm practices.
>
> 3. Storage, processing, food preservation.
>
> 4. Supplementary skills for farm maintenance and improvement, and sideline jobs for extra income.
>
> 5. Knowledge of government services, policies, programs, targets.
>
> 6. Knowledge and skills for family improvement (e.g., health, nutrition, home economics, child care, family planning) (Coombs and Ahmed, 1978, p. 17).

As a form of adult education, extension has been provided with or without adult literacy (Bhola, 1988). But what has been technologically possible has not been ideologically acceptable (Bhola, 1988). Technologically, literacy can be by-passed and extension education can be delivered over the radio or television. But "the medium is the message" (Bhola, 1988); and in by-passing literacy, not only are messages changed, but also dependent communication is perpetuated, and therefore, dependent community relationships (Freire, 1973). The new ideology of adult education insists on adult education with adult literacy. Thus, agricultural extension is seen as an instrument of conscientization, and of empowerment (Freire, 1973), and not merely a tool for the delivery of information and skills.

Critics of orthodox extension like Paulo Freire stress that the technology transfer approach embodies a "banking" concept of knowledge. People are thought to accumulate skills and information in static fashion, without mobilizing these inputs to resolve actual problems, Freire (1973) argues in contrast that the first precondition for change is for people to develop concepts that relate to their own conditions. Outsiders in this sense can never solve problems for local farmers; the original problems will reappear at a later date. Genuine problem-solving depends upon people coming to understand their situation and then showing a willingness to act in making things better. Lasting development only occurs when extension becomes part of a process for taking joint action. Freire (1973) terms this "problemitising," to distinguish it from problem-solving done by experts for people not with them. It grows out

of complex and extended interactions, in which outsiders serve simply as catalysts to encourage intercommunication between those experiencing a problem as they grope towards more effective modes of analysis and response. People must become the subjects of their own history, rather than the objects of external analysis. Freire's 1970s "dialogical extension" is thus "more akin to empowerment than to conventional technology transfer" (Freire, 1973).

Program planning in extension education

Central to the Extension organization is the program development process. Lawrence et al. (1973) defined extension program development as a series of interrelated processes directed towards accomplishing the educational mission and objectives of the organization. The authors described the process as including the following: 1) establishing the institutional framework for program development, 2) developing an organizational base for program development, 3) documenting the extension program (program determination), 4) developing an annual plan of work (program strategy), 5) implementing the program (program action), and 6) evaluating the program (accomplishment). Luffer (1978), Knowles (1980) and Boyle (1981) described steps that were similar to the above listed steps. Based on the analysis of these steps some scholars, such as Lawrence et al. (1973) cited in Kouzekanani (1983), have suggested certain knowledge and skills needed for the process. Those involved in program development, whether in agricultural extension or other organization should be able to perform appropriate skills as follows:

1. Establishment of the institutional framework:
   a. Identify beliefs and values systems.
   b. Delineate issues and concerns.
   c. Discern organizational objectives, define audiences.

2. Program development organizational base:
   a. Find, locate and analyze data.
   b. Identify potential audiences, define roles and needs.
   c. Analyze, build and maintain organizational structure.

3. Program determination:
   a. Collect and interpret data; infer appropriate educational objectives.
   b. Identify social systems and their leadership structure; involve in planning process through meaningful interaction.
   c. Select and interpret appropriate concepts and current research results.
   d. Describe local situations; establish needs, priorities, and program objectives with the assistance of planning groups.

4. Program strategy:
   a. Perceive behavioral changes needed to achieve the objectives.
   b. Construct an appropriate plan of work.
   c. Develop strategies for individual and social change.

5. Program action:
   a. Construct and conduct teaching, organizational and operational level plans.
   b. Identify, find, recruit, train, and counsel volunteers.
   c. Build human relations and organization skills.

6. Program evaluation:
   a. Identify data needed; collect, analyze, and interpret data.
   b. Analyze the updated situation and project objectives (Kouzekanani, 1983, p. 18-21).

Graduate Education for Extension Professionals

The number of international students in the United States has been growing. According to Thuemmel et al. (1982), at least 244 students from 44 nations were enrolled in agricultural education programs during 1978-

79. The same authors also reported that 79 percent of all foreign students enrolled in agricultural education in the United States were from countries in Africa and Asia. In many institutions of higher education in the United States, extension education is part of agricultural education programs. According to Barrick (1992) agricultural education has embraced extension education to a greater degree than any other area except teacher preparation. The author presented a conceptual model for a program of agricultural education in colleges and universities that included the following (Figure 3):

1. Teaching and learning
2. Communication
3. Research methodology and data analysis
4. Human resource development and management (Barrick, 1992)

Thuemmel et al. (1982) recommended that four factors should be considered in the development of programs in international agricultural education. According to the authors, all programs should:

1. Include more in-country training for international students.
2. Focus on preparing participants to train their less-developed country counterparts.
3. Be practical in content and be relevant to the needs of lesser developed countries.
4. Provide participants with knowledge, skills and attitudes needed to accomplish their task of facilitating agricultural progress in their own countries.

Thuemmel et al. (1982) identified some internationally oriented courses in agriculture aimed at fulfilling the educational needs of international students in agricultural extension education as follows:

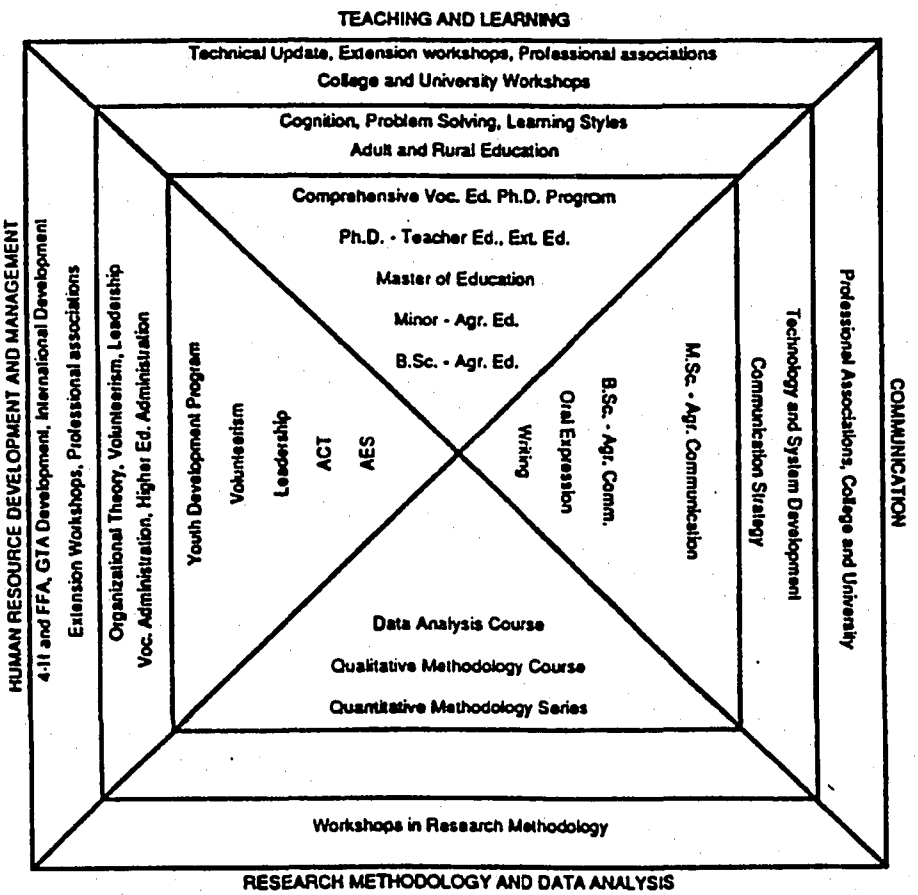

Figure 3. A conceptual model of the Department of Agricultural Education (Barrick, 1992, p. 35)

1. Agriculture in developing countries
2. Education for rural development
3. Educational programs in agriculture for developing countries
4. Extension methods for developing countries
5. Graduate study in international agriculture
6. International agriculture
7. International agriculture and world food problems
8. International agricultural technology
9. Seminars in international agriculture
10. World food and population problems
11. Undergraduate research in international agriculture (Theummel et al., 1982, p. 270).

Several colleges and universities in the United States have high-quality graduate programs in agricultural and extension education. In many of these institutions, extension education is part of agricultural education programs (Barrick, 1992). While it is recognized that different agricultural education departments adopted different programs, the following are a few examples.

The Department of Agricultural Education at Utah State University offers a master's program in International Agriculture Extension. To earn a master's degree, the student must complete 45 hours of credit that is approved by a graduate committee. The core curriculum includes the following:

1. Program Planning and Evaluation in Agricultural Education
2. Extension Principles and Practices
3. Personnel Supervision in Agricultural Extension
4. International Agricultural Extension Administration
5. Research and Thesis
6. Applied Anthropology and Cultural Change

7. Agricultural Communication
8. Economics in Less-Developed Countries
9. Public Personnel Administration
10. Public Finance Administration
11. Introduction to Educational Psychological Statistics
12. Human Development-Adult
13. Group Processes
14. Introduction to Educational and Psychological Research
15. Community Organization and Leadership (Utah State University, undated).

The Pennsylvania State University, University Park (1989) offered a Master's and Doctoral programs in Agricultural Extension Education. A minimum of 30 credits is required for the Master's program, 45 credits of graduate work beyond the Master's degree is required of the doctoral program. These include 12 credits in Extension techniques, communication and education; 3-4 credits in statistics; and at least 12 credits elected within a minor area of interest. Some of the graduate courses that are related to extension education are:

1. Communication Methods and Media
2. Methodology of Extension Education
3. Youth Program and Volunteer Management
4. Leadership and Social Change
5. The Cooperative Extension Organization
6. Communication Strategies and Theories for Developing Countries
7. Program Planning and Evaluation

8. Administration and Supervision
9. Scientific Methods in the Study of Agricultural Education
10. Statistics in Life Sciences.

The Department of Agricultural Education and Studies at Iowa State University, Ames (1991) offers Master's and Doctor of Philosophy degrees in Agricultural Education with a specialization in Agricultural Education and Extension. Thirty-two semester credit hours are required for the Master's degree and 40 semester credit hours beyond that are required for the Doctor of Philosophy degree. Some of the graduate courses related to extension education at Iowa State University are as follows:

1. Instructional Methods for Teaching in Agricultural Education
2. Program Development and evaluation in Agricultural Extension Education
3. Adult and Post-Secondary Education in Agriculture
4. Role of Agricultural Education and Agricultural Extension in Technology Transfer
5. Agricultural and Extension Education in Developing Countries
6. Evaluation in Agricultural Education
7. Curriculum Development in Agricultural Education
8. Seminar in Agricultural Education
9. Professional Development of Agricultural Educators
10. Administration and Supervision of Agricultural Education Programs
11. Philosophy and Policy Making in Agricultural Education
12. Research Procedures in Agricultural Education

13. Statistical methods for Research Workers

The Department of Agricultural Education at the Ohio State University, Columbus, requires that candidates for the master's degree, if they have not had previous professional experience, have a planned and supervised internship as part of their degree program (Kouzekanani, 1983).

Programs of agricultural and extension education have been a part of many universities in the United States since the turn of the century. These programs take different appearance in different institutions. The analysis of this portion of review of the literature revealed that certain learning activities could be utilized to train competent extension educators.

Chapter Summary

This chapter reviewed the various paradigms of knowledge generation, dissemination, and utilization. In many countries in Africa, Asia, and Latin America it was common to cite that lack of common understanding of the dissemination function stems from the competing views presented by the dominant categories of the conceptual models of knowledge and change. The discussion of the conceptual models can help overcome the conflicting views and expectations concerning the mission, place, and roles of the extension organization within the knowledge system.

Adult education, as a nonformal type of education, could facilitate the formation of community education for development, so that the attitudes and practices of its clientele could be improved. As a form of

adult education, extension education was understood to be needed to help farmers and their families. A common consensus among concerned individuals was the obligation to fulfill the educational needs of rural people; extension education was chosen as a strategy to achieve that end.

For the last three decades agricultural extension has been an integral part of the agricultural ministries of many nations in the Third World. In most of these countries, the missions and purposes of the extension organizations depended upon the nature of the colonial systems and the primary export crops. Many proposals to improve the performance of the extension organization in these countries dealt mainly with the question of methods. A number of authors suggested that alternative proposals should focus on and relate to more basic matters such as mission, place, and policy control of the organization.

Extension programming as a series of interrelated processes directed towards accomplishing the educational mission of the organization is fundamental to the performance of the organization. Professionals from the Third World are expected to be involved in these processes and it is incumbent on them to have a clear an thorough understanding of these processes related to their backgrounds. Broadening extension education curricula in universities of the United States and deepening the international content of graduate programs has the potential to be helpful not only for the international graduate students of extension education, but also to strengthen the leadership position of these institutions.

CHAPTER III. METHODS AND PROCEDURES

The purpose of this chapter is to discuss the methods and procedures used to conduct this study. After a review of the purpose, design, population, instrumentation, and data collection, data analyses will be presented.

The overall purpose of this study was to document the perceptions of extension educators and international students of extension toward extension education outside the United States and to determine if any relationships existed among these perceptions when selected demographic variables of each group were considered. A secondary purpose was to identify some of the educational training needs of international graduate students of extension education studying in the United States. Specific objectives of the study were to:

1. Describe characteristics of extension educators and international graduate students of extension education studying in the United States.
2. Document the perceptions of extension educators and international graduate students regarding selected characteristics and policies of the extension organizations outside the United States.
3. Document perceptions of extension educators and international graduate students of extension education toward what educational needs of rural people an extension organization ought to fulfill.

4. Document perceptions of extension educators and international graduate students toward agricultural extension program processes and practices and some of the training needs of the international graduate students of extension education studying in the United States.
5. Determine if there were differences between perceptions of extension educators and international graduate students of extension education toward agricultural extension program processes and practices, policies and characteristics of extension organizations outside the United States, educational needs of rural people and training needs of international graduate students of extension education.
6. Determine the relationships between characteristics of extension educators and international graduate students and their perceptions of extension education outside the United States.

Research Design

The research design reported in this study was descriptive and comparative in nature. According to Van Dalen (1979), this kind of research searches "for accurate information about characteristics of particular subjects, groups, institutions or situations or about the frequency with which something occurs" (Van Dalen, 1979, p. 285). Variables in this study included opinions and attitudes. Several demographic characteristics were also gathered. This research study used methods and procedures similar to that used by Kouzekanani (1983) in framework identification, instrumentation, and analysis to allow for

comparison with Kouzekanani's (1983) findings. Kouzekanani's study claimed to be "The first nationwide study of this type that has ever been done" (Kouzekanani, 1983, p. 164).

Population Selection

Framework of the study

The framework of this study consisted of all the institutions of higher education in the United States offering graduate programs in extension education. Directors of the Cooperative Extension Services of the 53 states and territories were contacted by mail and requested to provide the researcher with the names and addresses of universities, if any, in their respective states offering graduate programs in extension education (Appendix A). Forty-eight of the directors responded. Out of the responses received, 33 directors reported that there were schools in their respective states with departments that offered graduate programs in extension education. The rest of respondents reported that there were no schools in their states that had graduate program in extension education. All the 33 directors reported to the researcher names of contact persons, addresses, and phone numbers of the departments in their states. A list of 33 universities was compiled and classified according to regions in the United States. The 33 schools served as the frame of the study and are listed in Table 1 by regions. The framework identification process was completed in the late spring of 1992.

Table 2. Framework of the study

South
1. University of Arkansas, Fayetteville, Arkansas
2. Clemson University, Clemson, South Carolina
3. University of Florida, Gainesville, Florida
4. University of Georgia, Athens, Georgia
5. Louisiana State University, Baton Rouge, Louisiana
6. Mississippi State University, Mississippi State, Mississippi
7. North Carolina State University, Raleigh, North Carolina
8. Oklahoma State University, Stillwater, Oklahoma
9. University of Tennessee, Knoxville, Tennessee
10. Texas A&M, College Station, Texas
11. Virginia Tech, Blacksburg, Virginia

North East
12. Western Kentucky University, Bowling Green, Kentucky
13. Cornell University, Ithaca, New York
14. University of Maryland, Eastern Shore, Princess Anne, Maryland
15. University of Massachusetts, Amherst, Massachusetts
16. Pennsylvania State University, University Park, Pennsylvania
17. University of Vermont, Burlington, Vermont
18. West Virginia University, Morgantown, West Virginia

West
19. University of Idaho, Moscow, Idaho
20. Montana State University, Boseman, Montana
21. New Mexico State University, Las Cruces, New Mexico
22. Oregon State University, Corvallis, Oregon
23. Utah State University, Logan, Utah
24. Washington State University, Pullman, Washington

North Central
25. University of Illinois, Urbana, Illinois
26. Iowa State University, Ames, Iowa
27. Michigan State University, East Lansing, Michigan
28. University of Minnesota, St. Paul, Minnesota
29. Nebraska State University, Lincoln, Nebraska
30. North Dakota State University, Fargo, North Dakota
31. The Ohio State University, Columbus, Ohio
32. Purdue University, West Lafayette, Indiana
33. University of Wisconsin, Madison, Wisconsin

Population of the study

The target population of this study was comprised of: (1) International graduate students specializing in extension education, and (2) extension educators, in 33 departments that offered graduate programs in extension education in the United States in the Fall of 1992. The chairpersons of the departments offering graduate programs in extension education in the 33 schools were contacted and requested to provide the researcher with names and addresses of their extension educators and graduate international students who were interested in extension education. The chairpersons were also asked to report the nationality of their graduate students (Appendix B). After a follow up letter was sent to the chairpersons, the 33 chairpersons provided the information. The 33 schools reported as of Fall 1992, 96 extension educators and 128 international graduate students in extension education, as shown in Table 2. All the 96 extension educators and the 128 international graduate students were included in the study. This was a census study.

Instrumentation

A five-part survey instrument was developed and used by the researcher (Appendix C). Parts one through four of the instrument were the same for both groups; part five was different for each group and was designed to collect demographic data from each group. Most of the items included in parts one, three, and four were used previously by Kouzekanani in 1983. Content of part two was based upon a review of the literature.

Table 3. Population of the study

University	International students Number	%	Extension educator Number	%
A. South				
1. University of Arkansas	1		3	
2. Clemson University	0		5	
3. University of Florida	0		6	
4. University of Georgia	2		3	
5. Louisiana State University	2		3	
6. Mississippi State University	2		1	
7. North Carolina State University	5		3	
8. Oklahoma State University	5		2	
9. University of Tennessee	0		3	
10. Texas A&M University	1		3	
11. Virginia Tech.	0		1	
12. Western Kentucky University	0		1	
subtotal	18	14.1%	34	35.4
B. North East				
13. Cornell University	11		0	
14. University of Maryland, Eastern Shore	3		0	
15. University of Massachusetts	0		1	
16. Pennsylvania State University	9		19	
17. University of Vermont	1		2	
18. West Virginia University	3		2	
subtotal	27	21.1%	24	25%
C. West				
19. University of Idaho	1		4	
20. Montana State University	0		1	
21. New Mexico State University	3		2	
22. Oregon State University	0		2	
23. Utah State University	4		1	
24. Washington State University	0		4	
subtotal	8	6.3%	14	14.6%
D. North Central				
25. University of Illinois, Urbana	7		2	
26. Iowa State University	12		3	
27. Michigan State University	18		8	
28. University of Minnesota	3		4	
29. Nebraska State University	1		0	
30. North Dakota State University	0		1	
31. Ohio State University	18		5	
32. Purdue University	0		1	
33. University of Wisconsin	16		0	
subtotal	75	58.5%	24	25%
Total	128	100%	96	100%

Part one of the instrument consisted of fifteen processes and practices related to agricultural extension programs. The respondents were asked to indicate the importance of each by using a Likert-type scale (1 to 5): 1) not important, 2) somewhat important, 3) important, 4) very important, and 5) extremely important.

Part two of the instrument measured the level of agreement or disagreement among respondents about selected policies and characteristics of the extension organizations outside the United States. Respondents were asked to indicate their level of agreement or disagreement with twenty-seven statements that described policies and characteristics of extension organizations outside the United States. Subjects were asked to respond to each statement using a Likert-type scale (1 to 5): 1) strongly disagree, 2) disagree, 3) undecided, 4) agree, and 5) strongly agree.

Part three of the instrument included eight educational needs of the rural people directly engaged in agriculture that could be fulfilled by the extension organization. Respondents were asked to indicate their level of agreement or disagreement regarding what the agricultural extension ought to fulfill using a 5-point Likert-type scale: 1) strongly disagree, 2) disagree, 3) undecided, 4) agree, and 5) strongly agree.

Part four of the instrument contained twenty-eight items; each stated a specific training topic or skill that was related to agricultural extension practices and processes. Two adjacent Likert-type scales, one being a level of need for the items and the other a level of impor-

tance for the same items were used in this part. Respondents were asked to indicate their feeling about the importance of each item being included in curriculum for international graduate extension education students using the following scale: 1) not important, 2) somewhat important, 3) important, 4) very important, and 5) extremely important. International graduate students were also asked to describe their perception of their need for training/additional information for each of the same twenty-eight items. Extension educators were asked to describe their feeling about their international graduate students' need for training/additional information for each of the same twenty-eight items. Both groups were asked to use a Likert-type scale as follows: 1) not needed, 2) somewhat needed, 3) needed, 4) very needed, and 5) extremely needed.

Part five of the instrument collected selected demographic variables about respondents.

In order to alleviate possible measurement errors, the instrument were tested for its validity and reliability at Iowa State University. A panel of experts consisting of the members of the researcher's graduate advisory committee was formed. Each member of the panel was provided with a copy of the instrument and objectives of the study and requested to assess the instrument for instructions, item content, and validity of the scales used. Several changes were suggested and incorporated into the instrument. A similar instrument that was used by Kouzekanani (1983) to fulfill similar objectives was studied and approved in 1983 by a five-member panel of experts.

The instrument was pilot tested at Iowa State University. Nine native American graduate students in the Department of Agricultural Education and Studies and three international graduate students in the Department of Sociology were asked to respond to the items in the first four parts of the instrument. Their responses were analyzed through the use of Cronbach's Alpha procedure. The value was calculated to be .83 for the importance scale in part one, .72 for the agreement scale in part two, .77 for the agreement scale in part three, .87 for the need scale in part four, and .82 for the importance scale in part four. Kouzekanani (1983) reported Cronbach's Alpha of .50 for part one, .73 for part three, and .80 for part four. Several changes were suggested by the students included in the pilot test and incorporated into the instrument.

The Iowa State University Committee on Use of Human Subjects in Research reviewed this investigation and concluded that all rights and welfare of the human subjects were adequately protected, that risks were outweighed by the potential benefits and expected value of the knowledge sought, and that confidentiality of data was assured.

Data Collection

Data collection for this study was accomplished through the use of a mailed questionnaire. The mailing procedures were in accordance with recommendations made by Dillman (1978). All the questionnaires were coded in order to contact non-respondents. A copy of the instrument along with a cover letter (Appendix C) describing the purpose and the need for the study and a return self-addressed, stamped envelope were

sent to each of the subjects on January 20, 1993. The first mailing brought a response of 73 completed questionnaires from the extension educators (76%) and 68 completed questionnaires from the international graduate students (53.1%). The total response rate from both groups in the first mailing was 141 completed questionnaires for a return rate of 62.9%.

A follow-up letter (Appendix D) was sent six weeks after the initial mailing on March 1, 1993, to encourage participants to return completed questionnaires as soon as possible. Another copy of the questionnaire was sent with the follow-up letter in case the original was misplaced together with a self-addressed, stamped envelope. March 31, 1993 was established as the deadline; questionnaires received after that date were considered as late and were not included in the analysis of data. The second mailing resulted in an additional 10 questionnaires from extension educators and 8 from international graduate students for a total response of 159 completed questionnaires or 70.9%. One of the extension educators returned the questionnaire blank. Ten of the students could not be contacted.

In order to assess any possible differences between the respondents and the non-respondents, a random sample of ten of the non-respondents was drawn. This sample included five extension educators and five international graduate students. Questionnaires were mailed to these individuals together with a letter urging them to complete and return the questionnaire (Appendix D). Out of the ten non-respondents selected for the follow-up, eight individuals completed and returned the question-

naire. Of the eight non-respondents, four were extension educators and four were students. Of the extension educators, one was an assistant professor, one was an associate professor, and two were full professors. Three of the educators were male and one was female. Three of the extension educators indicated that they had more than ten years of work experience in extension education, two had taught extension education for over ten years, three indicated that they had acquired some kind of international experience, and three indicated that they had one or more international graduate student advisees. Of the four international graduate students, one was from Africa, one was from Latin America and two were from Asia, two were master's students and two were doctoral students, two indicated that they had acquired some kind of work experience with the agricultural extension organization in their home countries, and all of them were male students.

With regard to the demographic data gathered on the non-respondents group, it appeared that the non-respondents were fairly representative of the respondent group, with the possible exception that there were a greater number of individuals who were male. The t-test procedure was used to compare the respondents and the non-respondents in all variables to determine if differences existed between the two groups in their perceptions toward the agricultural extension education. The results in Appendix E, Tables 47 through 51 indicated that no significant difference existed in how the respondent and the non-respondent groups responded to all variables included in the survey instrument. Thus, the results of this study were generalized to the target population under study.

Coding of Data

Information obtained from the questionnaires was coded by the researcher and data were transferred and stored using the central computer facilities of Iowa State University as questionnaires were received. The accuracy of coding and data entry was determined by considering the length of each row. If it was shorter or longer than the number of columns in that row, all the row was erased and data entered again. A 30% (47 cases) random sample of entered questionnaires was checked for coding and data entry accuracy. After the first statistical program was run, a final check for accuracy of information was performed. Inconsistent data were not found.

Data Analysis

The data including scores on the inventory and demographic information were coded and analyzed by means of the Statistical Package for Social Sciences (SPSS) using the computer facilities of the Computation Center at Iowa State University. The alpha level for all tests was set beforehand at .05. The following statistical procedures were used to analyze the data:

1. The program FREQUENCY was used to determine frequency counts, percentages, means and standard deviations for the demographic variables.
2. The program RELIABILITY was used to test reliability of the instrument's scales.

3. The program FACTOR was used to identify a small number of variables which could be used to represent the relationships among sets of many interrelated variables in each of the first parts of the survey instrument.
4. The program T-TEST was used to determine any differences in perceptions between extension educators and international graduate students.
5. The program MANOVA was used to examine if relationships existed between groups' perceptions and their demographic characteristics.

A special procedure was used to compute ranks for means assigned to various items of importance of agricultural extension program processes and practices and importance and need of international graduate students training items. As a general rule, higher to lower ranks were assigned to mean ratings with higher to lower values. However, in cases where two items had the same mean values, a higher rank was assigned to the item/mean which the corresponding standard deviation value was lower, thereby indicating that individual respondent ratings were more tightly dispersed around that mean. The nonparametric correlation coefficient procedure, Spearman rank order correlation (rho), was used to disclose the degree of agreement among extension educators and international graduate students in ranking of the items in parts one and four. The following formula was used:

$$\rho = 1 - \frac{6\Sigma d^2}{n\,(n^2-1)}$$

where:

ρ = Spearman correlation Coefficient (rho),

d = difference between paired ranks, and

n = total number of paired ranks.

6. A Z-score was used to compare means and proportions of respondents' demographics in this study with findings of Kouzekanani's (1983) study.

$$Z = \frac{\bar{Y}_{93} - \bar{Y}_{83}}{\delta_{\bar{Y}}} = \frac{\pi_{93} - \pi_{83}}{\delta_{\pi}}$$

where:

$\bar{Y}_{93}$ = means in 1993

$\bar{Y}_{83}$ = means in 1983

π_{93} = proportions in 1993

π_{83} = proportions in 1983

$\delta_{\bar{y}}$ and δ_{π} = standard error.

Chapter Summary

This was a descriptive survey research of a comparative nature. The framework of the study was comprised of 33 land-grant universities offering graduate programs in extension education. There were two groups in the study: 1) extension educators, and 2) international graduate students of extension education studying in the United States schools.

The population of the study included 224 extension educators and international graduate students interested in extension education. The data for the study were collected from 95 extension educators and 118

international graduate students through the use of a mailed questionnaire. Since there was no difference between the respondents and non-respondents, the findings and results of this study were generalizable to the entire population.

According to Klinger (1973) and Van Dalen (1979), frame error, sampling error, non-response error, and measurement error could affect the internal and external validity of the findings and results of descriptive survey research. Sampling error did not apply to this research because it was a census study. The procedures used to identify the frame of the study were used by Kouzekanani (1983). The instrument was tested for its validity and reliability in order to minimize as much as possible any measurement error. The follow-up procedures collected the necessary information from the non-respondents; no significant difference between the respondents and the non-respondents was observed, therefore, non-respondent error was controlled.

CHAPTER IV: FINDINGS AND DISCUSSION

This dissertation research was directed toward extension education outside the United States in order to gather and document self-reported perceptions of extension educators and international graduate students of extension education in the United States. This chapter consists of a report of the findings of this study and focuses on the following research objectives:

1. Describe characteristics of extension educators and international graduate students of extension education studying in the United States.
2. Document the perceptions of extension educators and international graduate students regarding selected characteristics and policies of the extension organizations outside the United States.
3. Document perceptions of extension educators and international graduate students of extension education toward what educational needs of rural people an extension organization ought to fulfill.
4. Document perceptions of extension educators and international graduate students toward agricultural extension program processes and practices and some of the training needs of the international graduate students of extension education studying in the United States.
5. Determine if there were differences between perceptions of extension educators and international graduate students of extension education toward agricultural extension program processes and practices,

policies and characteristics of extension organizations outside the United States, educational needs of rural people, and training needs of international graduate students of extension education.

6. Determine the relationships between characteristics of extension educators and international graduate students and their perceptions of extension education outside the United States.

Analyses of data presented in this chapter included means, standard deviations, reliability coefficients, Spearman correlation coefficients, factor analysis, and multiple analysis of covariance. The alpha level was set prior to the analysis at .05.

Reliability of the Instrument

An instrument that included statements related to the agricultural extension was developed by the researcher and used to collect data for the study. Cronbach's alpha procedure was used to examine the level of internal consistency and stability of the grouped items in the parts of the instrument that used a five-point scale. The last part of the instrument asked demographic data and was not included in the reliability check. Results of the reliability tests are presented in Table 4, The alpha coefficient for the five instrument ratio scales ranged from .68 to .90. Because alpha coefficient values over .65 are deemed acceptable (Nunnally, 1982), it was appropriate to proceed with the analysis and interpretation.

Table 4. Cronbach's alpha reliability coefficients for scaled parts of the survey instrument

Instrument Part	Number of items	Educators (n=83)	Students (n=76)	All (n=159)
Program development process	15	.88	.87	.87
Characteristics and policies	27	.76	.78	.76
Educational needs of rural people	8	.83	.68	.76
Need for training items	28	.90	.90	.90
Importance of training items	28	.90	.90	.90

Characteristics of Extension Educators and International Graduate Students

Extension educators in this study were described according to the following characteristics: academic rank, gender, region, age, total years of work experience, years of work experience in extension education, total number of years teaching extension education courses, international experience acquired outside the United States, and the number of international student advisees. International graduate students of extension education were described according to the following characteristics: home origin, home country, current school program, number of years spent studying in the United States, total years of extension work experience at home, years of extension work experience in the United States, age, gender, and region. Frequency distribution and measures of central tendency were used to portray this information.

Extension educators

Eighty-three extension educators at 33 land-grant universities completed and returned the survey instrument. The following tables present the characteristics of the extension educators who participated in the study.

The findings presented in Table 5 show the distribution of extension educators by their academic rank. Twenty-four percent of the extension educators who participated in the study were assistant professors, 31% were associate professors, and 42% were professors. The findings of the study were consistent with Barrick's (1993) report of 1992-1993 full-time equivalent (FTE) faculty positions by region (Table 6). Kouzekanani's study of 101 extension educators in 1983 reported that 23% of all extension educator participants were assistant professors, 22% were associate professors and 54% were professors.

Table 5. Number and percentage of Extension educator respondents by academic rank

Academic rank	Number	Percentage
Assistant professor	20	24.1
Associate professor	26	31.3
Professor	35	42.2
No response	2	2.4
Total	83	100%

Table 6. 1992-1993 full-time equivalent (FTE) faculty positions by region

AAAE region	Assistant professor	Associate professor	Full professor	Total
Eastern	12.00	15.25	8.00	35.25
Central	9.05	19.30	24.45	52.80
Southern	15.02	19.84	36.03	70.89
Western	9.00	5.50	12.50	27.00
Total	45.07	59.89	80.98	185.94
Percentage	24.2%	32.2%	43.6%	100%

Source: Barrick (1993).

From the findings of the study that are presented in Table 7, it was apparent that approximately 80% of the extension educators who participated in the study were male and 18% were female with 2% unknown. Kouzekanani (1983) reported 91% of all extension educators surveyed in 1983 were male and almost 9% were female. A z-score comparison between the proportion of female extension educators in 1993 and 1983 indicated that the proportion of female extension educators significantly increased over the last ten years (p-value = .0359).

Table 8 shows the distribution of the extension educators who participated in the study by region. The extension educators surveyed were distributed fairly evenly across the four regions. Almost 35% of the extension educator respondents were in the southern region, 24% were in the northern eastern, about 17% were in the western and 24% were in the north central region.

Table 7. Number and percentage of Extension educator respondents by gender in 1993 and 1983

Gender	1993 Number	1993 Percentage	1983 Number	1983 Percentage
Female	15	18.1	9	8.9
Male	66	79.5	92	91.1
No response	2	2.4	0	0.0
Total	83	100%	101	100%

1983 Source: Kouzekanani (1983)

Table 8. Number and percentage of Extension educator respondents by region

Region	Number	percentage
South	29	34.9
North east	20	24.1
West	14	16.9
North central	20	24.1
Total	83	100%

Ages of extension educators who participated in this study are presented in four categories by decade as shown in Table 9. The ages of extension educators varied from 34 to 64 years. The average age of extension educators who participated in the study was 48.6 years. Further examination of the data indicates that extension educator participants were unevenly distributed among the four decade categories with about one-fourth between 51 and 60 years of age. Only 15% were

between 31 to 40 years, 25% were between 51 to 60 years and almost 10% were 61 years or more. Kouzekanani surveyed 101 extension educators in 1983 and reported that the average age of extension educator participants was 47 years. A z-score comparison between the average age of extension educator participants in 1993 and 1983 indicated that there was an increase in the average age of extension educators over the last ten years (p-value = .0367).

Table 9. Number and percentage of Extension educator respondents by age categories

Age	Number	Percentage
31-40	12	14.5
41-50	39	47.0
51-60	21	25.3
61 and above	8	9.6
No response	3	3.6
Total	83	100%

Mean 48.6 years

Data regarding extension educators total years of work experience by decade are shown in Table 10. The findings show that they were a very experienced group of people; the average extension educator respondent had about 25 years of total work experience. Only 2% had ten years or less of total work experience, 30% had between 11 and 20 years of work experience, and over half had over twenty years of work experience.

Table 10. Number and percentage of Extension educator respondents by total years of work experience

Years	Number	Percentage
1-10	2	2.4
11-20	25	30.1
21-30	27	32.5
31-40	22	26.5
No response	7	8.4
Total	83	100%

Mean 24.6 years

Table 11 shows the distribution of extension educators by their extension work experience. The average extension educator participant had about 16 years of work experience in extension education. Only one percent of all respondents indicated that they had not experienced working in extension education. Thirty-six percent had between one and ten years, 35% had between 11 and 20 years, 18% had between 21 and 30 years, and 7% of all respondents had 31 or more years of work experience in extension.

Kouzekanani (1983) reported that the extension educators who were surveyed in 1983 had an average of 15 years of work experience in extension education. A z-score comparison between extension educators' average years of extension work experience in 1993 and 1983 indicated that the average extension educator's years of work experience in extension education had remained unchanged since 1983 (p-value = .305).

Table 11. Number and percentage of Extension educator respondents by years of work experience in extension education in 1993 and 1983

Years	1993 Number	1993 Percentage	1983 Number	1983 Percentage
Zero	1	1.2	8	8.2
1-10	30	36.1	31	29.9
11-20	29	34.9	34	34.0
21-30	15	18.1	22	20.7
31 or more	6	7.2	6	6.2
No response	2	2.4	0	0.0
Total	83	100%	101	100%

Mean 15.5 years

1983 Source: Kouzekanani (1983)

Table 12 shows the distribution of extension educators who participated in the study by their total years of teaching extension education courses. The average extension educator participant had taught extension education courses for about 9 years. Eight percent of all extension educators who responded had not taught any extension education courses. Over half had taught extension education courses between 1 and ten years, 18% had taught extension education courses between 11 and 20 years and 10% had taught extension education courses for 21 years or more. Kouzekanani's survey of 101 extension educators in 1983 found that the average extension educator had taught extension education courses for 7.7 years. A z-score comparison between the average extension educator's years of teaching extension education courses in 1993 and 1983 indicated that

there was no difference between the average number of years an extension educator had taught extension education courses in 1993 and 1983 (p-value .0968). It was evident from comparing the data on the extension educators' number of years experience in extension education (Table 10) and the number of years that an extension educator taught extension education courses (Table 12), that an emphasis on extension education by agricultural education had increased within the last two decades.

Table 12. Number and percentage of extension educator respondents by total years of teaching extension education in 1993 and 1983

Total years of teaching extension education	1993		1983	
	Number	Percentage	Number	Percentage
Zero	7	8.4	13	13
1-10	49	59.0	62	61
11-20	15	18.1	20	20
21 or more	8	9.6	6	6
No response	4	4.8	0	0
Total	83	100%	101	100%

Mean = 8.8 years

1983 Source: Kouzekanani (1983)

Table 13 shows the distribution of extension educators by their international experience acquired outside the United States. It was evident that a large majority, 69%, of extension educator respondents had acquired some kind of international experience with less than a third of the respondents indicating that they had not acquired any international

experience outside the United States. Twenty-one percent reported that they had acquired less than one year of international experience, 29% reported that they had acquired between one and five years of international experience, and 19% reported that they had acquired more than five years of international experience. Kouzekanani (1983) reported that 53.5% of the 101 extension educators surveyed had had some kind of experience gained outside the United States. Results from a z-score comparison of the findings of two studies was evidence that the proportion of extension educators who gained international experience outside the United States had increased over the last ten years (p-value = .0162).

Table 13. Number and percentage of Extension educator respondents by total years of international experience acquired outside the United States

Years of international experience	Number	Percentage
None	24	28.9
Less than one year	17	20.5
1-5 years	24	28.9
More than five years	16	19.3
No response	2	2.4
Total	83	100%

Table 14 shows the distribution of the extension educators who participated in this study by their number of international graduate student advisees. More than half of the extension educators surveyed in this study indicated that they had international graduate student

advisees. Of these, more than half had between one and four international graduate student advisees (62%), one fourth, or 28%, had between 5 and 8 international graduate student advisees and only 11% had 9 international graduate student advisees or more. Of all respondents, 39% indicated that they had no international graduate student advisees. Kouzekanani (1983) reported that of all extension educators surveyed in 1983, 67% reported they had international graduate student advisees.

Table 14. Number and percentage of Extension educator respondents by number of international graduate student advisees

Number of international student advisee	Number	Percentage
Zero	32	38.6
1-4	29	34.9
5-8	13	15.7
9 or more	5	6.0
No response	4	4.8
Total	83	100%

International graduate students of extension education

Seventy-six international graduate students studying extension education in the United States responded to the survey. A summary of their characteristics is presented in the following section.

Tables 15 and 16 show the distribution of the international graduate student respondents by their home origin. Forty-four percent of all international graduate students who participated were from Africa, 34%

were from Asia, and 21% were from Latin America. Kouzekanani's survey of 98 international graduate students in 1983 reported that 51% of all respondents were from Asia, 36% were from Africa and 13% were from Latin and South America. As Table 16 shows, the international graduate student respondents represented a diverse group of students from 44 countries with the largest number (6) from Nigeria.

Table 15. Number and percentage of international graduate student respondents by continent

Continent	Number	Percentage
Africa	34	44.7
Asia	26	34.2
Latin America	16	21.1
Total	76	100%

Table 17 displays the distribution of the international graduate student respondents by their current degree program of study. The majority of the students surveyed reported that they were in their doctoral program (65%), 34% reported that they were in their master's program and one percent indicated a post-doctoral program. Kouzekanani (1983) found that 61% of the 98 international graduate students surveyed were in their master's program and 38% were in their doctoral programs.

Table 17 displays the distribution of the international graduate student respondents by their Bachelor's and Master's degrees. The majority of the international graduate student respondents indicated that

Table 16. Number and percentage of international graduate student respondents by country

Country	Number	Country	Number
Belize	1	Nicaragua	1
Botswana	1	Nigeria	6
Burundi	1	Nepal	1
Cameroon	2	Pakistan	3
China	2	Peru	3
Costa Rica	1	Puerto Rico	1
Egypt	2	Senegal	1
Ethiopia	1	Sri Lanka	2
Ghana	2	Sierra Leone	1
Guyana	1	Somalia	2
India	2	Sudan	5
Indonesia	1	Saudi Arabia	1
Iran	2	Swaziland	1
Japan	1	Taiwan	2
Jordan	1	Thailand	2
Kenya	2	Turkey	1
Korea	1	Uganda	1
Liberia	1	Uruguay	2
Malaysia	1	Venezuela	1
Mali	2	Yemen Arab Republic	1
Mexico	3	Zimbabwe	1
Malawi	1	No response	4
Mauritania	1	Total	76

Table 17. Number and percentage of international graduate student respondents by current school program

Degree program	Number	Percentage
Master's	26	34.2
Doctoral	49	64.5
Postdoctoral	1	1.3
Total	76	100%

Table 18. Number and percentage of international graduate student respondents by Bachelor's and Master's degrees

	Bachelor's		Master's	
	Number	Percentage	Number	Percentage
Within the United States	15	19.7	59	77.6
Outside the United States	61	80.3	17	22.4
Total	76	100%	76	100%

they had received their bachelor's degrees from schools outside the United States (80%), and almost 20% indicated that they had received their bachelor's degree from schools in the United States. Contrary to that, the majority of the international graduate students surveyed indicated that they had received their master's degrees from schools in the United States (78%) and 22% of the international graduate students indicated that they had received their master's degrees from schools outside the United States. The findings of this study were similar to Kouzekanani's (1983) findings that 56% of all international graduate student surveyed in 1983 had received their bachelor's degrees in schools outside the United States and 76% of the students surveyed had received their master's degrees from schools in the United States.

Table 19 displays the distribution of international graduate student respondents by their number of years spent studying in the United States. The data show that the average international graduate student had been studying in the United States for about four years. Sixty-one percent of all respondents indicated that they had been studying in the United

Table 19. Number and percentage of international graduate student respondents by years of study in the United State

Years	Number	Percentage
1-3	46	60.5
4-6	21	27.6
7 or more	6	7.9
No response	3	3.9
Total	76	100%

Mean 3.5 years

States between one to three years; 28% of all respondents had been studying in the United States between 4 to 6 years and only 8% had been studying in the United States for 7 years or more. Kouzekanani (1983) reported that the average international graduate student in 1983 had studied for 3.1 years in the United States. Data comparison using z-score indicated that there were some evidence that the average international graduate student of extension education in 1983 might have taken a fewer number of years than the average international graduate student of extension education in 1993 to complete his/her degree in the United States (p-value = .0455).

Table 20 displays the distribution of the international graduate student by their total years of extension education work acquired in their home countries. They were an experienced group of people; the average international graduate student participant had acquired about five years of extension work experience in his/her home country. Of all

Table 20. Number and percentage of international graduate student respondents by total years of extension work experience acquired in their home countries

Years	Number	Percentage
Zero	17	22.4
1-5	32	42.1
6-10	21	27.6
11-15	4	5.3
16 or more	2	2.6
Total	76	100%

Mean = 4.9 years

the student respondents, 78% indicated that they had acquired some kind of extension work experience in their home countries; 17% indicated that they had not acquired any extension work experience in their home countries. Forty-two percent of the international graduate students surveyed reported that they had acquired between one to five years of extension work experience in their home countries, 28% had acquired between 6 to 10 years of extension work experience, about 5% had acquired between 11 to 15 years of extension work experience, and only 3% of all student respondents indicated that they had acquired 16 years or more of extension work experience in their home countries. Kouzekanani (1983) reported that of the 98 international graduate student surveyed in 1983, 74% indicated that they had acquired some kind of extension work experience in their home countries.

Table 21 displays the distribution of the international graduate student respondents by their total years of extension work experience that was acquired in the United States. The data showed that more than three-quarters of the international graduate student participants had not acquired any extension work experience in the United States (86%); only 15% of all student respondents indicated that they had acquired some work experience with the Cooperative Extension Service in the United states. Kouzekanani (1983) reported that of the 98 international graduate students surveyed in 1983, 21% had acquired some kind of practical experience with the Cooperative Extension Service in the United States. A z-score comparison provided evidence that the proportion of the international graduate student of extension education who had practical experience in extension education in the United States had remained unchanged since 1983 (p-value = .1151)

Table 21. Number and percentage of international graduate student respondents by total years of extension work experience in the United States

Years	Number	Percentage
Zero	65	85.3
One or more years	11	14.5
Total	76	100%

Mean = 0.28 years

Table 22 displays the distribution of the international graduate students by age, presented in three categories by decade. The average age of the international graduate students who participated in the study was 35 years, an indication that they were a mature group of students. More than half of the student respondents were above the average age and only two percent of all student participants were in the age category 45 years or more. Kouzekanani (1983) reported the average age of international graduate students surveyed in 1983 was 33 years. A z-score comparison between the average ages of international graduate student of extension education in 1993 and 1983 indicated that the average age of international graduate students significantly increased over the last ten years (p-value = .0002).

Table 22. Number and percentage of international graduate student respondents by age categories

Age	Number	Percentage
25-34	31	40.8
35-44	40	52.6
45 or more	2	2.6
No response	3	3.9
Total	76	100%

Mean = 34.9 years

Table 23 shows the distribution of the international graduate student respondents by their gender. Twenty-six percent of all international graduate student participants were female and about 74% were male. Kouzekanani (1983) reported that of all 98 international graduate student surveyed in 1983, only 9% were female students. There was strong evidence that the proportion of female international graduate student of extension education increased over the last decade (p-value = .0019).

Table 23. Number and percentage of international graduate student respondents by gender

Gender	Number	Percentage
Female	20	26.3
Male	56	73.7
Total	76	100%

Table 24 displays the distribution of the international graduate student respondents by region in the United States. International graduate students surveyed were unevenly distributed in the four regions. More than half of the international graduate students were concentrated in the north central region, about 24% were in the north eastern region, almost 11% were in the south, and only 9% of all international graduate student participants were in the western region.

Table 24. Number and percentage of international students by region

Region	Number	Percentage
South	8	10.5
North East	18	23.7
West	7	9.2
North Central	43	56.6
Total	76	100%

Perceptions of Agricultural Extension Education

The first four parts of the survey instrument collected the perceptions of extension educators and international graduate students toward agricultural extension education. The four parts dealt with the extension program development process, selected policies and characteristics of the agricultural extension organization, educational needs of the rural people, and international graduate students' training needs. This section will document and discuss the perceptions of the extension educator and international graduate student respondents toward each of these four areas.

Agricultural extension program development process

The first part of the survey instrument contained fifteen items that were related to the agricultural extension program planning process. Respondents were asked to indicate how important it was for an extension program planner in Africa, Asia, and Latin America to be able to do each of the processes. The importance level was examined as a continuum with

"not important" at one end of the spectrum and "extremely important" at the other end. Data were treated as interval rather than nominal. Means and standard deviations were calculated for each of the items and the t-test procedure was used to compare the two groups, extension educators and international graduate students. A mean score for each of the items was computed. The mean scores were used to rank the fifteen items. Extension educator and international graduate student respondents responses were tabulated and presented in Table 25.

The extension educator respondents perceived that it was important for an extension program planner in Africa, Asia, and Latin America to be able to do all fifteen processes. Mean scores for the extension educator respondents ranged from 3.02 to 4.77 on a five-point scale. The extension educator respondents data indicated that it was extremely important for an extension planner in Africa, Asia, and Latin America to be able to: (1) analyze situations, concerns, interests and needs of the clients (4.77); (2) formulate realistic and meaningful program goals (4.64); and (3) state clearly the philosophy of the extension program (4.64). The items that the extension educator respondents ranked lowest in terms of their importance for an extension program planner were: (1) utilize computer for word processing and data analysis (3.02); and (2) use survey methods to seek information (3.28).

International graduate student respondents also perceived that it was important for an extension program planner in Africa, Asia, and Latin

Table 25. Perceived importance of the agricultural extension program processes and practices as reported by extension educators and international graduate students

Agricultural extension program processes and practices	Overall rating (n=159) Mean / S.D.	Rank	Extension educators (n=83) Mean / S.D.	Rank	International students (n=76) Mean / S.D.	Rank	T-value	α-tail probability
The extension program planners in Africa, Asia, and Latin America should be able to:								
State clearly the philosophy of their extension program	4.48 / 0.83	3	4.64 / 0.62	3	4.32 / 0.99	5	-2.43††	.017*
Analyze situations, concerns interests, and needs of their clients	4.76 / 0.52	1	4.77 / 0.45	1	4.75 / 0.59	1	-0.25††	.802
Formulate realistic and meaningful program goals	4.59 / 0.64	2	4.64 / 0.55	2	4.53 / 0.72	2	-1.09††	.276
Organize and utilize group participation methods during program implementation	4.23 / 0.80	6	4.17 / 0.72	6	4.29 / 0.88	6	0.93	.351
Consider the national policy in preparing extension education programs	3.94 / 0.93	8	3.96 / 0.79	8	3.92 / 1.06	10	-0.29††	.771
Design both an annual and long-range plan of work	4.18 / 0.85	7	4.10 / 0.89	7	4.26 / 0.79	7	1.24	.215
Operate within the expected administrative framework	3.61 / 0.94	12	3.73 / 0.89	10	3.49 / 0.99	14	-1.64	.103

Assess the effects and outcomes of their extension programs	4.46 0.68	4	4.42 0.57	4	4.51 0.79	3	.89	.373
Utilize the results of program evaluation initiatives	4.37 0.72	5	4.33 0.70	5	4.41 0.73	4	.69	.493
Understand relationship among national and international institutions involved in the agricultural knowledge system	3.71 0.96	11	3.48 0.89	12	3.95 0.55	9	3.11	.002**
Select and supervise staff	3.77 0.97	9	3.79 0.97	9	3.75 0.98	11	-0.26	.797
Use survey methods to seek information	3.44 1.04	14	3.28 0.93	14	3.62 1.13	13	2.09	.038*
Analyze and interpret data derived from a survey	3.76 1.06	10	3.57 1.00	11	3.96 1.10	8	2.36	.019*
Outline appropriate staff recruitment plans	3.53 1.02	13	3.43 0.99	13	3.63 1.04	12	1.26	.209
Utilize computers for word processing and data analysis	3.18 1.15	15	3.02 1.04	15	3.36 1.24	15	1.84	.067

††Separate variance estimate.

*Denotes significant differences between groups at .05 level.

**Denotes significant differences between groups at .01 level.

Spearman Correlation Coefficient rho = 0.91

Scale: 1. Not important; 2. Somewhat important; 3. Important; 4. Very important; 5. Extremely important.

America to be able to do all fifteen processes related to the extension program development. Mean scores for the international graduate student respondents ranged from 3.36 to 4.75 on a five-point scale. They gave the highest ratings to the same two topics as the educators. The international graduate student respondents perceived that it was extremely important for an extension program planner to be able to: (1) analyze situations, concerns, interests and needs of the clients (4.75); (2) formulate realistic and meaningful program goals (4.53); and (3) assess the effects and outcomes of their programs (4.51). Items that were ranked lowest in terms of their importance by the international graduate student respondents included: (1) utilize computers for word processing and data analysis (3.36); and (2) operate within the expected administrative framework (3.49).

Extension educators' mean scores were compared to the international graduate students' mean scores on each of the fifteen items. The data in Table 25 indicated that the mean scores of the international graduate student respondents were significantly higher at the .05 level than those of the extension educator respondents in the following items: (1) understand relationships among national and international institutions involved in agricultural knowledge system, (2) use survey methods to seek information, and (3) analyze and interpret data derived from a survey. Students' scores were significantly lower for the following item: state clearly the philosophy of their extension program. However, the magnitude of the Spearman correlation coefficient (rho) for the groups' rankings in Table 25 was 0.91. This coefficient indicated a high degree

of agreement on the ranking of the fifteen items by extension educator and international graduate student respondents. The results in this section indicated that from among the extension program development processes the extension educators tended to place more emphasis on the institutional framework establishment and less emphasis on the program determination; in contrast, the international graduate students tended to emphasize both the institutional framework establishment and the program evaluation aspects of the extension program development process and to place less emphasis on the program action process.

A study that was conducted by Kouzekanani in 1983 showed similar results and trends in the perceptions of extension educators and international graduate students of extension education toward the agricultural extension program development process. Kouzekanani (1983) found that both the extension educators and international graduate students of extension education surveyed perceived all the processes related to agricultural extension program development to be very important. The process of planning realistic and meaningful educational programs based upon the specific analysis of situations, concerns, interests and needs of clients was ranked highest in terms of importance by both groups. Kouzekanani (1983) reported that the extension educators tended to emphasize processes that were related to program strategy; international graduate students, on the other hand, tended to emphasize processes that were related to program evaluation. No measurement was employed by Kouzekanani (1983) to investigate possible differences between the extension educators and international graduate students in their percep-

tions toward the agricultural extension program development processes.

Policies and characteristics of the extension organization

The second part of the instrument included twenty-seven items that were related to the policies and characteristics of the extension organization in Africa, Asia and Latin America. These items were compiled after a careful literature search on policies and characteristics of the agricultural extension organization in Africa, Asia, and Latin America and represented some of the generalizations and claims that were suggested by researchers and scholars. In this part subjects were asked to indicate their agreement or disagreement with each of the twenty-seven statements. The agreement/disagreement level was examined as a continuum with "strongly disagree" at one end and "strongly agree" at the other. Data were treated as interval. The mean score and standard deviation for each of the statements were computed and the t-test procedure was used to compare the mean scores of the two groups in each statement. Responses from extension educators and international graduate students are presented in Table 26.

The first five items in this part were related to the philosophy and mission of the agricultural extension organization. The data in Table 26 indicated that the extension educator respondents strongly agreed that the extension education organization in Africa, Asia and Latin America should have both a clearly stated educational philosophy and mission. The two ideas also were supported by the international graduate student

Table 26. Means, standard deviations, and t-test of each of the selected policies and characterisitcs of the extension organization as reported by extension educators and international graduate students

Selected policies and characteristics of the extension organization	Extension educators (n=83) Mean S.D.	International students (n=76) Mean S.D.	t-value	α-tail probability
The Extension Organization in Africa, Asia, and Latin America should:				
Have a clearly stated educational philosophy	4.62 0.56	4.21 1.08	-2.98††	.003**
Have a clearly stated educational mission	4.67 0.50	4.28 1.06	-2.91††	.004**
Derive its mission from the national policies	3.79 0.84	3.68 1.13	-0.70††	.483
Function according to its own philosophy	3.90 0.89	3.80 1.06	-0.63	.527
Enforce the government's production goals	2.37 1.09	3.28 1.13	5.12	.000**
Have priorities based on national policies	3.49 0.82	3.52 1.20	0.16††	.875
Have priorities based on research findings	4.24 0.73	4.09 1.03	-0.98††	.328

††Separate variance estimate.

*Significant at α = 0.05.

**Significant at α = 0.01.

Spearman Correlation Coefficient rho = 0.91

Scale: 1. Strongly disagree; 2. Disagree; 3. Undecided; 4. Agree; 5. Strongly agree.

Table 26. Continued

Selected policies and characteristics of the extension organization	Extension educators (n=83) Mean S.D.	International students (n=76) Mean S.D.	t-value	α-tail probability
Have priorities based on the numbers of farmers affected	3.90 0.90	4.07 0.99	1.09	.277
Have priorities based on availability of human resources	3.93 0.70	4.13 0.85	1.65	.101
Be within the Ministry of Agriculture	3.34 1.08	3.80 1.27	2.43	.016*
Be within the Ministry of Education	2.56 1.02	2.54 1.35	-0.07††	.943
Be within the University (e.g., College of Agriculture)	3.96 0.89	3.88 1.27	-0.48††	.636
Be involved in educational duties	4.49 0.67	4.13 1.05	-2.56††	.012*
Be involved in educational and noneducational duties (such as distribution of inputs/loans)	2.46 1.09	3.34 1.36	4.49††	.000**
Use a "top-down" (i.e., someone at the top of the administrative hierarchy propose the major ideas) type of program development	2.24 1.12	1.96 1.23	-1.46	.146

Table 26. Continued

Selected policies and characteristics of the extension organization	Extension educators (n=83) Mean S.D.	International students (n=76) Mean S.D.	t-value	α-tail probability
Use a "bottom-up" (i.e., someone at the lowest level level of the organization comes up with an idea and passes it through the organization as a means of program determination) type of program development	3.96 0.90	4.24 0.96	1.886	.064
Operate under policies established by the sponsor (e.g., Ministry of Agriculture)	3.33 0.92	3.15 1.34	-0.99††	.322
Operate under policies established by the clientele (e.g., small farmers)	3.67 1.10	3.80 1.21	0.73	.467
Operate under polices established by international agencies (e.g., the World Bank)	2.71 1.00	2.29 1.19	-2.40	.017*
Operate under policies established by both the sponsor and the clientele	3.91 1.06	4.07 1.09	0.90	.372
Operate under policies established by both the sponsor and the international agencies	3.03 1.07	2.75 1.27	-1.48	.142
Operate under policies establsihed by a combination of the sponsor, the clientele, and the international agencies	4.00 1.06	4.01 1.05	0.08	.936

Table 26. Continued

Selected policies and characteristics of the extension organization	Extension educators (n=83) Mean S.D.	International students (n=76) Mean S.D.	t-value	α-tail probability
Be funded by the central government	3.50 0.90	3.58 1.09	0.50	.621
Be funded by local sources (e.g., regions/ districts)	3.53 0.78	3.53 0.99	0.06††	.954
Be funded by combination of central government and local sources	4.49 0.59	4.47 0.91	-0.22††	.826
Focus on technology (recommendation from research)	3.81 0.84	3.69 1.25	-0.69††	.491
Focus on increasing the capacity of the people (empowering people)	4.57 0.55	4.51 0.89	-0.51††	.609

respondents, but to a significantly lesser degree than by the extension educators. The data also indicated that while the international graduate student respondents remained undecided, extension educator respondents strongly rejected the concept that enforcing governmental production goals should be the essence of the agricultural extension organization. However, both groups supported the concept that the agricultural extension organization derives its mission from national policies. No significant differences were observed between the groups' mean scores on

the last two items. Results on the first five items were a clear indication that extension educators tended to more strongly support claims by Claar et al. (1983) and Claar (1984) than the international graduate students. The authors advocated that the agricultural extension organization in the Third World should maintain an educational mission. Furthermore, the idea of the agricultural extension organization deriving its mission from the government goals seemed to be more acceptable by all respondents than the idea that the agricultural extension should adopt and enforce these goals as an ultimate mission. Although government production goals in most of the Third World countries emphasized increasing the export crops (Seepersad, 1985), Van den Ban (1982) noted that the ideas that agricultural extension was a way to educate farmers and that it was an instrument of government policy were not in disagreement. The author suggested that some of the goals of government policy could be reached if the farmers made better decisions that were in their own interests.

Four items asked about the bases of prioritizing by the agricultural extension organizations (items 6, 7, 8, and 9 in Table 26). Responses from extension educators indicated higher support for the idea that the agricultural extension organization should have its priorities based on research findings, followed by the idea that agricultural extension organization priorities should be based on availability of human resources. The least agreed upon idea was to have agricultural extension organization priorities based on the number of farmers affected. Extension educators remained undecided about the idea that the agricultural

extension organization should have its priorities based on national policies. In contrast, international graduate student respondents supported all four items. Priorities based on availability of human resources received the highest support, followed by research findings, number of farmers affected and finally national policies. No significant differences were observed between the two groups in their responses to items regarding setting a basis for priorities.

The place of the agricultural extension organization was the focus of items 10, 11, and 12 in Table 26. The extension educator respondents supported the idea that the extension organization should be interfaced within the university while remaining undecided about whether the extension organization should be placed within the Ministry of Agriculture and/or within the Ministry of Education. International graduate student respondents supported the ideas that the extension education should be within the Ministry of Agriculture and the University. International graduate students gave the highest support among the three ideas to the idea that the organization should be within the University. They were undecided about placing the agricultural extension organization within the Ministry of Education. Significant differences were observed between the two groups on their agreement to the idea that the extension organization should be within the Ministry of Agriculture with the international graduate students' significantly higher than that of the extension educators.

Items 13 and 14 asked about the focus of the agricultural extension organization on educational versus non-educational assignments. The idea

that the agricultural extension organization should be involved in educational duties was supported by both extension educator and international graduate student respondents. Extension educator respondents strongly rejected the idea that the agricultural extension organization should be involved in both educational and non-educational duties. However, results from the international student respondents indicated indecision on this idea. These findings were congruent with the results of the study on the first five items.

The findings also indicated significant differences between the mean scores of the extension educators and international graduate students on both items with the mean score of the extension educators significantly higher than that of the international graduate students on item 13, (educational duties) and lower in item 14, (both educational and non-educational duties).

The focus of items 15 and 16 was on the agricultural extension organization type of program development. Item 15 stated that the agricultural extension organization should use a top-down approach to program development, and item 16 stated that the agricultural extension organization should use a bottom-up approach to program development. The idea that the agricultural extension organization should use a top-down approach to program development was the most strongly rejected idea by both the extension educator and the international graduate student respondents. Both groups agreed that a bottom-up type of program development should be used by the agricultural extension organization when developing its program. No significant differences were observed

between the mean scores of these two items.

Items 17, 18, 19, 20, 21, and 22 dealt with who should establish the policies for the agricultural extension organization operation. The extension educator respondents agreed to the ideas that: the agricultural extension organization should operate under policies established by the sponsor (government) and the clients (farmers); and under policies established by a combination of the sponsor, the client, and the international agencies; however, the second idea received the highest level of agreement. The findings indicated that the extension educator respondents were undecided about the idea that the agricultural extension organization should operate under policies established by the international agencies alone. In contrast, the international graduate student respondents rejected the idea that the policies should be established by the international agencies alone and agreed to the ideas that the agricultural extension organization should operate under policies established by the sponsor and the clients and under policies established by a combination of the sponsor, the clients and the international agencies. Students, however, agreed more highly to the idea that policies be established by the sponsor and the clients than the idea that policies for the organization should be established by the sponsor, the clients and the international agencies.

Funding of the agricultural extension organization was the focus of items 23, 24, and 25. Both the extension educator and the international graduate respondents supported the three ideas. The idea that the agricultural organization should be funded by both the central government

and local sources received the highest level of agreement from both groups.

Items 26 and 27 focused on what the agricultural extension organization should emphasize: empowering rural people or transferring research recommendations. The idea that the agricultural extension organization should focus on empowering the people was strongly supported by both groups. This was the only single idea in this part that was strongly supported by the international graduate student respondents. Both groups, however, agreed to item 26; no significant differences were noted between the groups' mean scores.

Findings from the current study supported those of Kouzekanani (1983). He surveyed 101 extension educators and 98 international graduate students of extension education and reported that both the extension educators and the international graduate students strongly supported that the agricultural extension organization in the Third World should use a combination of a top-down and bottom-up approach to program development, and operated under policies established by the sponsor (the government) and the clients (the farmers). However, both the extension educators and the international graduate students rejected the top-down approach to program development and the ideas that the sponsor or the clientele alone established the policy for the operation of the agricultural extension organization.

The educational needs of the rural people

The third part of the survey instrument included eight items that represented educational needs of rural people directly engaged in agriculture. Respondents rated their agreement/disagreement about the agricultural extension organization in Africa, Asia and Latin America taking the responsibility of fulfilling each of the need items. A Likert scale that had "strongly disagree" at one end and "strongly agree" at the other was used. Data were treated as interval. The mean score and standard deviation for each of the eight items were computed and the t-test procedure was employed to compare the two groups' mean scores on each item. Extension educator and international graduate student respondents responses are presented in Table 27.

The focus of the first item was the idea that the agricultural extension organization in Africa, Asia, and Latin America ought to fulfill the basic educational needs of the rural people, such as reading and writing. Both the extension educator and international graduate student respondents were undecided on this item. No significant difference were noted in the groups' mean scores. It is interesting to note here that although both groups had supported the concepts that the agricultural extension organization should adopt an educational philosophy and mission and focus on increasing the capacity and empowering the rural people in the second part of the questionnaire, both groups remained undecided about whether the agricultural extension organization should fulfill the basic educational needs of the rural people. The

Table 27. Means, standard deviations and t-test for the educational needs of rural people items as reported by extension educators and international graduate students

Educational needs of rural people	Extension educators (n=83) Mean S.D.	International students (n=76) Mean S.D.	t-value	α-tail probability
General or basic education (e.g., reading, writing)	3.18 1.13	3.16 1.39	-0.09	.926
Application of new inputs: varieties, improved farm practices, etc.	4.45 0.63	4.43 0.78	-0.12	.906
Applications of new and improved practices related to livestock	4.42 0.65	4.35 0.84	-0.59††	.559
Food storage, processing and preservation	4.53 0.55	4.42 0.72	-1.08††	.283
Knowledge and skills for family improvement (e.g., health care, nutrition, home economics, child care, family planning)	4.57 0.55	4.35 0.91	-1.76††	.080
Civic skills (e.g., knowledge of how cooperatives, local governments, and national governments function)	4.17 0.79	4.03 0.93	-1.03	.307
Supplementary skills for farm maintenance and improvement	4.27 0.59	4.35 0.67	0.86	.391
Farm business management	4.46 0.55	4.43 0.66	-0.26	.793

[a]Not significant at α = 0.05 and 0.001.

††Separate variance estimate.

Scale: 1. Strongly disagree; 2. Disagree; 3. Undecided; 4. Agree; 5. Strongly agree.

idea that adult and extension education could be delivered without adult literacy was strongly rejected by some scholars (Freire, 1973; and Bhola, 1989). Both authors suggested that adult literacy could help rural masses break the communication dependency and hence increase the capacity to adopt new technology.

Rural people's educational needs related to application of new inputs, varieties and improved farm practices was the focus of the second item. Both the extension educator and international graduate student respondents supported this idea with no significant difference in their mean scores.

The idea that the agricultural extension organization ought to fulfill the educational needs of rural people related to food storage, processing and preservation was strongly supported by the extension educator respondents. The data indicated that the international graduate student respondents also supported the idea. Similarly, the data in Table 27 show that the extension educators strongly agreed with the idea that the agricultural extension organization ought to fulfill the educational needs of rural people for knowledge and skills for family improvement. Again the international graduate students supported the idea; no significant difference was noted between groups' mean scores.

The focus of item 6 was that agricultural extension organization ought to fulfill rural people's educational needs for civic skills. Both the extension educator and international graduate student respondents supported the idea with no significant difference between their mean scores.

The seventh item's focus was on the idea that the agricultural extension organization ought to fulfill rural people's educational needs for skills related to farm maintenance and improvement. Both groups supported the idea with no significant difference. Similarly, item 8, which focused on the idea that the agricultural extension organization ought to fulfill rural people educational needs for farm business management, was supported by the two groups with no significant difference in their mean scores.

Kouzekanani's study in 1983 showed that while the extension educators rejected the concept that the agricultural extension organization should commit its resources to meet the general and basic educational needs of the rural people, the international graduate students who responded to the survey supported the concept. Other ideas related to the educational needs of the rural people that were investigated by Kouzekanani (1983) and that were included in this study were enthusiastically supported by both the extension educators and the international graduate students.

International graduate student educational needs

The fourth part of the survey instrument was designed to document the perceptions of the respondents on educational and training needs of international graduate students. Twenty-eight items that were related to the educational needs of international graduate students of extension education were compiled from the literature and used in this part. Two indicators were used to measure the perceived training needs. The first

indicator was the perceived training needed for each item and the second indicator was the perceived importance of the same item. In a study which assessed county extension agents' training needs in seven states, Jahi (1980) said:

> The investigators usually use the perceived amount of training needed to measure the magnitude of agents' felt needs, and use the perceived importance to measure the magnitude of the agents' wants (Jahi, 1980, p. 73).

Jahi (1980) speculated that needs and wants were two separate entities, which might have similar or different meanings, depending on the amount of divergence they had in expressing a demand for learning experience. This current study used both indicators to measure the actual and potential demands of international graduate students for learning experiences in agricultural education and extension. All subjects were asked in this part to use the importance scale to express their feeling about the importance of each of the twenty-eight items that might be included in a curriculum for international graduate students of extension education. The subjects were also asked to use the need scale. The extension educators were asked to use the scale to indicate their feelings about their international graduate students' needs for training and additional information on each item. The international graduate students were asked to describe their need for training and additional information for each item at the time when they started their graduate program in the United States.

Tables 28 and 29 show respondents' mean scores, standard deviations, rank orders and a comparison of the groups' mean scores on both the importance and need scales for each item. Tables 30 and 31 provide additional information on how each of the group responded to the items on both importance and need scales.

The data of Table 28 display the responses to the training items on the importance scale. The data indicated that both the extension educator and international graduate student respondents considered all of the twenty-eight training items important to be included in a curriculum intended for international graduate students of extension education. The mean scores for the twenty-eight items as perceived by the extension educators ranged from 2.65 to 4.61. Table 28 also shows international graduate students ratings of the importance of the same twenty-eight training items. The mean scores of the twenty-eight training items as perceived by international graduate students ranged from 2.91 to 4.66.

The extension educator respondents rated the following training highest in terms of importance: (1) program planning (4.61), (2) teaching methods (4.51), (3) program evaluation (4.49), (4) needs assessment (4.38), and (5) leadership (4.24). Items that were rated lowest in terms of their importance by the extension educators included: (1) impact of technology on family (3.43), (2) statistical methods (3.39), (3) concepts and theories of rural sociology (3.39),

Table 28. Perceived importance of the selected skills and training items as reported by extension educators and international graduate students

Selected skills and training items	Overall rating (n=159) Mean / S.D.	Rank	Extension educators (n=83) Mean / S.D.	Rank	International students (n=76) Mean / S.D.	Rank	T-value	α-tail probability
Research methodology	4.16 / 0.92	8	3.81 / 0.90	15	4.52 / 0.80	4	5.17	.000**
Statistical methods	3.71 / 0.97	22	3.39 / 0.91	25	4.05 / 0.93	15	4.52	.000**
Program evaluation	4.53 / 0.66	2	4.49 / 0.71	3	4.57 / 0.68	3	0.81	.419
Administration	3.74 / 0.94	20	3.58 / 0.94	22	3.92 / 0.91	18	2.32	.022*
Program planning	4.63 / 0.57	1	4.61 / 0.56	1	4.66 / 0.58	1	0.49	.627

††Separate variance estimate.

*Denotes significant differences between groups at .05 level.

**Denotes significant differences between groups at .01 level.

Spearman Correlation Coefficient rho = 0.78.

Scale: 1. Not important; 2. Somewhat important; 3. Important; 4. Very important; 5. Extremely important.

Table 28. Continued

Selected skills and training items	Overall rating (n=159) Mean / S.D.	Rank	Extension educators (n=83) Mean / S.D.	Rank	International students (n=76) Mean / S.D.	Rank	T-value	α-tail probability
Teaching methods	4.36 / 0.78	4	4.51 / 0.66	2	4.20 / 0.88	9	-2.42††	.015*
Adult learning theories	4.14 / 0.86	9	4.15 / 0.81	7	4.13 / 0.92	12	-0.12	.905
Staff development	3.81 / 0.91	19	3.78 / 0.81	17	3.84 / 1.01	22	0.44	.659
Youth program management	3.69 / 0.94	23	3.66 / 0.90	20	3.72 / 0.98	26	0.38	.704
Organizing presentation and media selection	3.82 / 0.87	18	3.71 / 0.77	18	3.93 / 0.96	17	1.57††	.118
Agricultural extension in the Third World Countries	4.07 / 1.00	12	3.69 / 1.06	19	4.47 / 0.76	5	5.28††	.000**
Curriculum development	3.89 / 1.00	16	3.89 / 0.99	13	3.89 / 1.03	20	0.04	.971
Philosophy of agricultural and extension education	3.99 / 0.97	15	3.90 / 1.00	12	4.09 / 0.93	14	1.24	.216
Leadership	4.22 / 0.83	7	4.24 / 0.79	5	4.19 / 0.87	10	-040	.688
Implementing international & rural development programs	4.10 / 0.92	11	4.04 / 0.76	10	4.17 / 1.06	11	0.85††	.397

Major world food issues	3.61 0.97	26	3.48 0.86	23	3.76 1.07	25	1.81	.072
Impact of technology on family	3.63 1.01	25	3.43 0.93	24	3.84 1.07	23	2.59	.010*
Diffusion and adoption of innovations	4.26 0.83	6	4.19 0.87	6	4.33 0.76	7	1.03	.305
Rural community development issues	4.26 0.83	5	4.11 0.87	9	4.41 0.76	6	2.29	.023*
Application of computers in educational settings	3.30 1.12	27	3.01 0.95	27	3.60 1.21	27	3.35††	.001**
Concepts and theories in rural sociology	3.63 0.97	24	3.39 0.92	26	3.89 0.95	19	3.36	.001**
Communication theories and methods	4.11 0.87	10	4.11 0.81	8	4.11 0.92	13	-0.04	.967
Technology and social change in the Third World	4.01 0.86	14	3.83 0.85	14	4.20 0.82	8	2.78	.006**
Needs assessment	4.48 0.70	3	4.38 0.72	4	4.59 0.66	2	1.91	.058
Internship in cooperative extension	3.72 1.04	21	3.65 1.02	21	3.80 1.07	24	0.90	.372
Critical thinking	4.03 1.01	13	4.03 0.95	11	4.04 1.07	16	0.09	.927
Human behavior	3.85 0.99	17	3.80 0.89	16	3.89 1.09	21	0.59	.558
History of the cooperative extension	2.77 1.17	28	2.65 1.03	28	2.91 1.31	28	1.35	.178

(4) application of computers in educational settings (3.01), and (5) history of the Cooperative Extension (2.65).

International graduate student respondents rated the following training items highest in terms of importance: (1) program planning (4.66), (2) needs assessment (4.59), (3) program evaluation (4.57), (4) research methodology (4.52), and (5) agricultural extension in the Third World (4.47). Items that were rated lowest in terms of their importance by the international graduate students included: (1) internship in Cooperative Extension (3.80), (2) major world food issues (3.76), (3) youth program management (3.72), (4) application of computers in educational settings (3.60), and (5) history of the Cooperative Extension (2.91).

The data in Table 28 also indicated several significant differences between the mean scores of the two groups. Extension educator respondents mean score was significantly higher than the mean score of the international graduate student respondents on the perceived importance of teaching methods. In contrast, the mean scores of the international graduate student respondents were significantly higher than those of the extension educators on nine items including: (1) research methodology, (2) statistical methods, (3) administration, (4) agricultural extension in the Third World, (5) impact of technology on family, (6) rural community development issues, (7) application of computers in educational settings, (8) concepts and theories in rural sociology, and (9) technology and social change in the Third World. However, the magnitude of the Spearman correlation coefficient (rho) for the rankings in Table 28 was

0.77. This coefficient indicated a high degree of agreement on the rankings of the perceived importance of the training items by both groups.

Table 29 summarizes the perceived need for the same twenty-eight training items by extension educator and international graduate student respondents. Both groups considered all the twenty-eight training items to be needed by the international graduate students of extension education. Mean scores for the twenty-eight items as perceived by the extension educators ranged from 2.75 to 4.54. International graduate students' mean scores ranged from 2.92 to 4.59.

Items that were rated highest by the extension educators in terms of felt need for training included: (1) program planning (4.54), (2) program evaluation (4.51), (3) teaching methods (4.47), (4) needs assessment (4.33), and (5) diffusion and adoption of innovations (4.23). The items that were rated lowest by extension educators in terms of felt need for training were: (1) statistical methods (3.49), (2) impact of technology on family (3.42), (3) major world food issues (3.30), (4) application of computers in educational settings (3.10), and (5) history of the Cooperative Extension (2.75).

Items that were rated highest by the international graduate students in terms of felt need for training included: (1) program planning (4.59), (2) program evaluation (4.54), (3) needs assessment (4.51), (4) research methodology (4.40), and (5) agricultural extension in the Third World (4.36). Items that were rated lowest by the international graduate students in terms of felt need for training: (1) internship in

Table 29. Perceived need of the selected skills and training items as reported by extension educators and international graduate students

Selected skills and training items	Overall rating (n=159) Mean / S.D.	Rank	Extension educators (n=83) Mean / S.D.	Rank	International students (n=76) Mean / S.D.	Rank	T-value	α-tail probability
Research methodology	4.09 / 0.87	10	3.82 / 0.76	17	4.40 / 0.88	4	4.30	.000**
Statistical methods	3.75 / 0.96	21	3.49 / 0.80	24	4.04 / 1.04	12	3.61††	.000**
Program evaluation	4.52 / 0.68	2	4.51 / 0.64	2	4.54 / 0.74	2	0.32	.746
Administration	3.77 / 0.94	20	3.62 / 0.90	23	3.93 / 0.97	16	2.02	.045*
Program planning	4.57 / 0.61	1	4.54 / 0.60	1	4.59 / 0.63	1	0.50	.620

††Separate variance estimate.

*Denotes significant differences between groups at .05 level.

**Denotes significant differences between groups at .01 level.

Spearman Correlation Coefficient rho = 0.68.

Scale: 1. Not needed; 2. Somewhat needed; 3. Needed; 4. Very much needed; 5. Extremely needed.

Table 29. Continued

Selected skills and training items	Overall rating (n=159) Mean / S.D.	Rank	Extension educators (n=83) Mean / S.D.	Rank	International students (n=76) Mean / S.D.	Rank	T-value	α-tail probability
Teaching methods	4.29 / 0.86	4	4.47 / 0.64	3	4.09 / 1.02	10	-2.71††	.008**
Adult learning theories	4.05 / 0.94	11	4.14 / 0.78	7	3.96 / 1.08	14	-1.16††	.246
Staff development	3.79 / 0.93	19	3.80 / 0.84	18	3.79 / 1.02	21	-0.08	.939
Youth program management	3.71 / 0.94	22	3.76 / 0.85	19	3.64 / 1.04	26	-0.75	.452
Organizing presentation and media selection	3.89 / 0.91	16	3.85 / 0.82	16	3.91 / 1.00	18	0.44	.658
Agricultural extension in the Third World Countries	3.97 / 1.03	12	3.63 / 1.08	22	4.36 / 0.82	5	4.58	.000**
Curriculum development	3.85 / 0.98	18	3.91 / 0.91	13	3.79 / 1.06	21	-0.78	.437
Philosophy of agricultural and extension education	3.91 / 0.98	14	3.87 / 0.94	14	3.94 / 1.02	15	0.43	.666
Leadership	4.11 / 0.88	8	4.22 / 0.81	6	3.99 / 0.94	13	-1.63	.105
Implementing international & rural development programs	4.11 / 0.88	8	3.99 / 0.81	11	4.25 / 0.93	8	1.80	.074

Major world food issues	3.50 0.94	26	3.30 0.90	26	3.72 0.94	25	2.76	.007*
Impact of technology on family	3.58 0.99	25	3.42 0.90	25	3.76 1.06	23	2.14	.034*
Diffusion and adoption of innovations	4.27 0.87	5	4.23 0.91	5	4.31 0.89	7	0.57	.567
Rural community development issues	4.14 0.87	6	3.99 0.91	12	4.31 0.79	6	2.31	.022*
Application of computers in educational settings	3.29 1.08	27	3.10 0.96	27	3.51 1.18	27	2.32	.022*
Concepts and theories in rural sociology	3.71 0.98	22	3.54 0.90	23	3.89 1.03	19	2.16	.033*
Communication theories and methods	4.13 0.77	7	4.14 0.73	7	4.13 0.81	9	-0.10	.921
Technology and social change in the Third World	3.91 0.93	14	3.76 0.94	19	4.07 0.90	11	2.07	.040*
Needs assessment	4.41 0.72	3	4.33 0.77	4	4.51 0.67	3	1.53	.129
Internship in cooperative extension	3.70 1.12	24	3.67 1.03	20	3.73 1.21	24	0.34	.737
Critical thinking	3.97 1.01	12	4.01 0.88	9	3.92 1.13	17	0.58††	.562
Human behavior	3.87 0.96	17	3.86 0.88	15	3.89 1.05	19	0.17	.868
History of the cooperative extension	2.83 1.16	28	2.75 0.99	28	2.92 1.32	28	0.88††	.382

Cooperative Extension (3.73), (2) major world food issues (3.72), (3) youth program management (3.63), (4) application of computers in educational settings (3.51), and (5) history of the Cooperative Extension (2.92).

Several significant differences were observed between the mean scores of the two groups. The mean scores of the extension educators were significantly higher than those of the international graduate students on the felt needs for the following items: (1) teaching methods, and (2) agricultural extension in the Third World. In contrast, the mean scores of the international graduate students were significantly higher in the following items: (1) research methodology, (2) administration, (3) major world food issues, (4) impact of technology on family, (5) rural community development issues, (6) application of computers in educational settings, (7) concepts and theories in rural sociology, and (8) technology and social change in the Third World.

In spite of these differences in the mean scores, the magnitude of the Spearman correlation coefficient (rho) for the rankings in Table 29 was 0.68. This indicated a substantial degree of agreement on the rankings of the twenty-eight training items in terms of the felt need for training by the two groups.

Tables 30 and 31 summarize the perceptions of the extension educator and international graduate students respondents. Table 30 displays how the extension educator respondents ranked the twenty-eight training items using the importance and need scales. The data indicated that the extension educators ranked the twenty-eight training items the same on

Table 30. Means, standard deviations, and rank orders of the need for and importance of 28 training items be included in curriculum for international students as reported by extension educators

Selected skills and training items	Extension educators (n=83) Importance Mean / S.D.	Rank	Need Mean / S.D.	Rank
Research methodology	3.81 / 0.90	15	3.82 / 0.76	17
Statistical methods	3.39 / 0.91	25	3.49 / 0.80	24
Program evaluation	4.49 / 0.71	3	4.51 / 0.64	2
Administration	3.58 / 0.94	22	3.62 / 0.90	23
Program planning	4.61 / 0.56	1	4.54 / 0.60	1
Teaching methods	4.51 / 0.66	2	4.47 / 0.64	3
Adult learning theories	4.15 / 0.81	7	4.14 / 0.78	7
Staff development	3.78 / 0.81	17	3.80 / 0.84	18
Youth program management	3.66 / 0.90	20	3.76 / 0.85	19
Organizing presentation and media selection	3.71 / 0.77	18	3.85 / 0.82	16

Spearman correlation coeff. rho = 0.98.

Scales:

Importance	Need
1. Not important	1. Not needed
2. Somewhat important	2. Somewhat needed
3. Important	3. Needed
4. Very important	4. Very much needed
5. Extremely important	5. Extremely needed

Table 30. Continued

Selected skills and training items	Extension educators (n=83) Importance Mean S.D.	Rank	Need Mean S.D.	Rank
Agricultural extension in the Third World countries	3.69 1.06	19	3.63 1.08	22
Curriculum development	3.39 0.99	13	3.91 0.91	13
Philosophy of agricultural extension and education	3.90 1.00	12	3.87 0.94	14
Leadership	4.24 0.79	5	4.22 0.81	6
Implementing international and rural development programs	4.04 0.76	10	3.99 0.81	11
Major world food issue	3.48 0.86	23	3.30 0.90	26
Impact of technology on family	3.43 0.93	24	3.42 0.90	25
Diffusion and adoption of innovations	4.19 0.87	6	4.23 0.86	5
Rural community development issues	4.11 0.87	9	3.99 0.91	12
Application of computers in educational settings	3.01 0.95	27	3.10 0.96	27
Concepts and theories in rural sociology	3.39 0.92	26	3.54 0.90	23
Communication theories	4.11 0.81	8	4.14 0.73	7

Table 30. Continued

Selected skills and training items	Extension educators (n=83) Importance Mean S.D.	Rank	Need Mean S.D.	Rank
Technology and social change in the Third World countries	3.83 0.85	14	3.76 0.94	19
Needs assessment	4.38 0.72	4	4.33 0.75	4
Internship in cooperative extension	3.65 1.02	21	3.67 1.03	20
Critical thinking	4.03 0.95	11	4.01 0.88	9
Human behavior	3.80 0.89	16	3.86 0.88	15
History of the cooperative extension	2.65 1.03	28	2.75 0.99	28

the importance and need scales. This also was confirmed by the high magnitude of the Spearman correlation coefficient (rho) which was calculated at .98, indicating a high degree of agreement between the ranks of the twenty-eight training items on the two dimensions. The same trend was observed in the international graduate student respondents' data in Table 30 with Spearman (rho) of .98. This result suggested that the perceived importance and felt need scales might have similar meaning to the subjects of this survey.

Table 31. Means, standard deviations, and rank orders of the need for and importance of 28 training items be included in curriculum for international students as reported by international graduate students

Selected skills and training items	Extension educators (n=76) Importance Mean / S.D.	Rank	Need Mean / S.D.	Rank
Research methodology	4.52 / 0.80	4	4.40 / 0.88	4
Statistical methods	4.05 / 0.93	15	4.04 / 1.04	12
Program evaluation	4.57 / 0.68	3	4.54 / 0.74	2
Administration	3.92 / 0.91	18	3.93 / 0.97	16
Program planning	4.66 / 0.58	1	4.59 / 0.63	1
Teaching methods	4.20 / 0.88	9	4.09 / 1.02	10
Adult learning theories	4.13 / 0.92	12	3.96 / 1.08	14
Staff development	3.84 / 1.01	22	3.79 / 1.02	21
Youth program management	3.72 / 0.98	26	3.64 / 1.04	26

Spearman correlation coeff. rho = 0.98.

Scales:

Importance	Need
1. Not important	1. Not needed
2. Somewhat important	2. Somewhat needed
3. Important	3. Needed
4. Very important	4. Very much needed
5. Extremely important	5. Extremely needed

Table 31. Continued

Selected skills and training items	Extension educators (n=76) Importance Mean S.D.	Rank	Need Mean S.D.	Rank
Organizing presentation and media selection	3.93 0.96	17	3.91 1.00	18
Agricultural extension in the Third World countries	4.47 0.76	5	4.36 0.82	5
Curriculum development	3.89 1.03	20	3.79 1.06	21
Philosophy of agricultural extension and education	4.09 0.93	14	3.94 1.02	15
Leadership	4.19 0.87	10	3.99 0.94	13
Implementing international and rural development programs	4.17 1.06	11	4.25 0.93	8
Major world food issue	3.76 1.07	25	3.72 0.94	25
Impact of technology on family	3.84 1.07	23	3.76 1.06	23
Diffusion and adoption of innovations	4.33 0.89	7	4.31 0.89	7
Rural community development issues	4.41 0.76	6	4.31 0.79	6
Application of computers in educational settings	3.60 1.21	27	3.51 1.18	27
Concepts and theories in rural sociology	3.89 0.95	19	3.89 1.03	19
Communication theories	4.11 0.92	13	4.13 0.81	9

Table 31. Continued

Selected skills and training items	Extension educators (n=76) Importance Mean S.D.	Rank	Need Mean S.D.	Rank
Technology and social change in the Third World countries	4.20 0.82	8	4.70 0.90	11
Needs assessment	4.59 0.66	2	4.15 0.67	3
Internship in cooperative extension	3.80 1.07	24	3.73 1.21	24
Critical thinking	4.04 1.07	16	3.92 1.13	17
Human behavior	3.89 1.09	21	3.89 1.05	19
History of the cooperative extension	2.91 1.31	28	2.92 1.32	28

Similar results were found by Kouzekanani (1983) who reported that extension educators and international graduate students surveyed in 1983 perceived that the following training items were essential to be included in a curriculum intended for international graduate students of extension education: (1) program planning, (2) program evaluation, (3) administration; and (4) teaching methods. Youth program management, world food and population problems, and world food economics were rated lowest among training topics in terms of their being essential in a curricula for international graduate students of extension education. Although the

data reported by Kouzekanani (1983) showed that some of the training topics such as research methods and design, teaching methods, and extension methods for the Third World countries were rated very differently by extension educators and international graduate students, Kouzekanani (1983) employed no measurement to investigate possible differences that might exist between the perceptions of the extension educators and the international graduate students.

Relationships Between Respondents' Characteristics and Their Perceptions Toward Extension Education

Related to the sixth objective of this study, this section will present the analysis of the relationships between the respondents' demographic characteristics and their perceptions toward extension education.

Factor analysis to reconstruct the dependent variables

The perceptions of the respondents in each of the four first parts of the survey instrument were treated as dependent variables. In each part, the FACTOR analysis procedure was used to simplify the dependent variables in these four parts. Principal components extraction technique (PC) was used in the factor analysis. To cross-validate the factor analysis, the maximum likelihood (ML) extraction technique as well as two rotation methods (VARIMAX) and (OBLIMIN) were used. Each of the analyses identified the same factor indices. Factor indices identified in each part were given names to summarize the variables loading heavily on them. In each part, the factor scores were saved and used for further analysis.

RELIABILITY procedure was used to test the reliability of each index. The factor indices identified and the variables included under each were as follows:

Agricultural extension program processes and practices The first part of the survey instrument included fifteen items that were related to the agricultural extension program processes and practices. Table 32 displays the three factor indices identified in this part. Variables loading heavily on the first identified factor index were all related to the establishment of the institutional framework and program development organizational base. Delineating issues and concerns (item 2), formulating program goals (item 3), finding, locating, and analyzing data (items 8 and 9), identifying beliefs and values systems (item 1), defining roles (item 11) and identifying and involving potential program audiences (item 4) were the variables identified under this factor index. The second factor index in this part included five items that were related to program determination. Identifying, collecting analyzing and interpreting needed data (items 15, 12 and 13), identifying social systems and their leadership (item 10) and establishing staffing needs and priorities (item 14) were the items that were included under this factor index. The third factor index identified in this part included three items that were related to the program strategy and action. Developing strategies for individual and social change (item 5 and 7) and constructing appropriate work plans (items 6) were the items included under this factor index.

Table 32. Factors identified by factor analysis of fifteen items related to agricultural extension program processes and practices

Variables	Item number	Factor loadings	Cronbach's alpha
Factor 1 (Establishment of the institutional framework)			.79
Analyze situations, concerns, interests and needs of client	2	.80757	
Formulate realistic and meaningful program goals	3	.75362	
Utilize the results of program evaluation initiatives	9	.68103	
Assess the effects and outcomes of their extension programs	8	.66296	
State clearly the philosophy of their extension program	1	.62124	
Select and supervise staff	11	.45462	
Organize and utilize group participation methods	4	.42842	
Factor 2 (Program determination)			.81
Utilize computer for word processing and data analysis	15	.81172	
Use survey methods to seek information	12	.74029	
Analyze and interpret data derived from survey	13	.73700	
Outline appropriate staff recruitment plans	14	.59253	
Understand relationship among national/international institutions involved in agricultural knowledge system	10	.53077	
Factor 3 (Program strategy and action)			.67
Consider the national policy in preparing extension programs	5	.78817	
Operate within the expected administrative frame	7	.74957	
Design both an annual and long-range plan	6	.63305	

Cronbach's alpha coefficients for the three factor indices identified in the first part ranged from .67 to .81. These scores were an indication that the reliability of the scores was acceptable.

Policies and characteristics of the agricultural extension organization Table 33 displays the nine factor indices that were identified in the second part of the survey instrument. Variables loading heavily on the first factor index were related to leadership and the style of management of the extension organization. Funding by a combination of the central government and some local sources (item 11c), the style of the extension program development (items 9a and 9b) and focusing the organization on increasing the capacity of the people (item 13) were the items included under this factor index. The second factor index identified in this part included items that were closely related to the educational principles that guide the extension organization. Having a clearly stated educational philosophy and mission (items 1 and 2), functioning according to its own educational philosophy rather than functioning under the control of the government policies (item 4), and having its priorities based on the research findings (item 6b) were the items that were included under this factor index. The third factor index included four items that were closely related to the issue of agricultural extension organization policy establishment and control (items 10a, 10c 10d and 10e). The fourth factor index included items that were related to government-responsive agricultural extension organization. Having priorities based on the national policies (item 6a), deriving the

Table 33. Factors identified by factor analysis of twenty-seven items related to policies and characteristics of the agricultural extension organization

Variables	Item number	Factor loadings	Cronbach's alpha[a]
Factor 1 (Management of the organization)[a]			.67
Be funded by a combination of central government and local sources	11c	.68716	
Use bottom-up type of program development	9b	.68411	
Focus on increasing the capacity of the people	13	.63981	
Use top-down type of program development	9a	-.58590	
Factor 2 (Organization guiding principles)			.77
Have a clearly stated educational mission	2	.85928	
Have a clearly stated educational philosophy	1	.83718	
Function according to its own philosophy	4	.64566	
Have priorities based on research findings	6b	.51514	
Factor 3 (Policy control)			.73
Operate under policies established by both the sponsor and the international agencies	10e	.86019	
Operate under policies established by the international agencies	10c	.85842	
Operate under policies established by the sponsor	10a	.53028	
Operate under policies established by a combination of the sponsor, client and international agencies	10d	.52837	
Factor 4 (Government-responsive organization)			.68
Have priorities based on the national policies	6a	.87046	
Derive its mission from the national policies	3	.82037	
Enforce the government production goals	5	.62439	
Be with the Ministry of Agriculture	7a	.41763	

Factor 5 (Government-client responsive organization)			.61
Be funded by local sources	11b	.81808	
Be funded by central government	11a	.63766	
Operate under policies established by the client	10b	.51299	
Operate under policies established by the sponsor and the client	10d	.49436	
Factor 6 (Organization performance stimulation)[a]			.40
Be involved in both educational and non-educational duties	8b	.69581	
Have priorities based on availability of human resources	6d	.55826	
Have priorities based on number of farmers affected	6c	.49107	
Be involved in educational duties	8a	-.47383	
Factor 7 (Organization focus)[b]			
Focus on technology	12	.79160	
Factor 8 (Ministry setting)[b]			
Be within the Ministry of Education	7b	.79395	
Factor 9 (University setting)[b]			
Be within University (e.g., College of Agriculture)	7c	.61141	

[a]Cronbach's alpha calculated after reversing the coding of items with negative factor loading.

[b]Cronbach's alpha cannot be calculated for indices with one variable.

mission from the national policy (item 3), enforcing the government production goals (item 5) and having the organization within the Ministry of Agriculture (item 7a), were the items that were included under this factor index. These variables represented some of the distinctive characteristics of the government-controlled agricultural extension organization. The fifth factor index identified in this part included four items that were closely related to the characteristics of a government-client responsive agricultural extension organization. Being funded by both the central government and local sources (items 11a and 11b), operating under policies established by the client or a combination of the client and the government (items 10b and 10d), were the items that were identified under this factor index. The sixth factor index in this part included items that were closely related to some of the agricultural extension performance stimulation factors. Involving the organization in both educational and non-educational duties and or in educational duties only (item 8a and 8b), having priorities based on availability of human resources or number of the farmers affected (items 6c and 6d) were the items identified under this factor index. These items represent some of the driving forces that might stimulate the performance of the agricultural extension organization. The seventh factor index included one item that was related to the focus of the organization on technology transfer (item 12). The eighth and ninth factors were related to the placement and interface of the agricultural extension organization. Being either within the Ministry of Education or within a university setting (items 7b and 7c) were the items included under these factor indices.

Cronbach's' alpha coefficients for the factor indices identified under this part ranged between .40-.77.

Educational needs of the rural people Table 34 displays the two factor indices that were identified in the third part of the survey instrument. Items loading heavily on the first factor index identified were closely related to the type of knowledge that helps individuals acquire agricultural production skills. Learning that was related to the application of new and improved farm practices, and new inputs and varieties (item 3 and 2), farm maintenance skills (item 7), farm management skills (item 8), and food processing (item 4), were included under this factor index. The second factor index in this part included three items that were closely related to the learning that helps individuals acquire social and political consciousness. Knowledge and skills for family improvement (item 5), general or basic education (item 1) and civic skills (item 6) were the items that were included under this factor index. Cronbach's' alpha for the factor indices identified in this part were .85 and .56.

Educational needs of the international graduate students The fourth part of the survey instrument included twenty-eight items that were related to the educational needs of the international graduate students of extension education. Two adjacent scales were used in this part, need and importance. Different factor indices were identified under the two scales.

Table 34. Factors identified by factor analysis of eight items related to the educational needs of the rural people

Variables	Item number	Factor loadings	Cronbach's alpha
Factor 1 (Knowledge to acquire scientific consciousness)			.85
Application of new and improved practices related to livestock	3	.88300	
Application of new inputs, varieties and improved farm practices	2	.84774	
Supplementary skills for farm maintenance and farm improvement	7	.72559	
Farm business management	8	.72366	
Food storage, processing and presentation	4	.64932	
Factor 2 (Knowledge to acquire social and political consciousness)			.56
Knowledge and skills for family improvement (health care, nutrition, etc.)	5	.75028	
General or basic education (reading, writing, etc.)	1	.72145	
Civic skills (how cooperatives, national/local government function)	6	.67326	

Table 35 displays the factor indices that were identified in the forth part of the survey instrument under the need scale. The first factor index identified in this part included educational items that were closely related to the process of rural community development social change. The items identified under this factor index included: technology and social change in the Third World (item 23), communication (item 22), concepts and theories in rural sociology (item 21), major world food issues (item 16), impact of technology on family (item 17), rural community development issues (item 19), and diffusion and adoptions of innovations (item 18). The second factor index identified in this part included four items that were closely related to the teaching-learning process. The items identified under this factor index included: teaching methods (item 6), adult learning theories (item 7), organizing presentation and media selection (item 10), and human behavior (item 27). The third factor index identified in this part included items that were closely related to the process of program planning and evaluation. The three items that were identified under this factor index included: program planning (item 5), program evaluation (item 3), and needs assessment (item 24). The fourth factor index identified in this part included three items that were related to the process of human resource development and management. The items identified under this factor index included: staff development (item 8), administration (item 4), and youth program management (item 9). The fifth factor index identified in this part included items that were closely related to the research methods and

Table 35. Factors identified by factor analysis of twenty-eight items related to the training needs of international graduate students of extension education (need scale)

Variables	Item number	Factor loadings	Cronbach's alpha
Factor 1 (Technology and social systems)			.81
Technology and social change in the Third World	23	.77670	
Communication theories and methods	22	.63250	
Concepts and theories in rural sociology	21	.55219	
Major world food issues	16	.54702	
Impact of technology on family	17	.53661	
Rural community development issues	19	.50049	
Diffusion and adoption of innovation	18	.48765	
Factor 2 (Teaching and learning process)			.70
Teaching methods	6	.77691	
Adult learning theories	7	.67002	
Organizing presentation and media selection	10	.51472	
Human behavior	27	.44768	
Factor 3 (Program planning and evaluation)			.74
Program planning	5	.80058	
Program evaluation	3	.71820	
Needs assessment	24	.53889	
Factor 4 (Human resource development and management)			.71
Staff development	8	.73740	
Administration	4	.68258	
Youth program management	9	.62625	

Factor 5 (Research methodology and statistics)			.68
Statistical methods	2	.84874	
Research methodology	1	.80618	
Application of computers in educational settings	20	.45252	
Factor 6 (Agricultural and extension education)			.61
Philosophy of agricultural extension and education	13	.75443	
Agricultural extension in the Third World countries	11	.57744	
Curriculum development	12	.55180	
Factor 7 (The cooperative extension organization)			.60
Internship in Cooperative Extension	25	.67838	
History of Cooperative Extension	28	.56205	
Critical thinking	26	.51188	
Factor 8 (Leadership for social change)			.50
Implementing international and rural development program	15	.71814	
Leadership	14	.53016	

data analysis. The items identified under this factor index included: statistical methods (item 2), research methodology (item 2) and application of computers in educational settings (item 20). The sixth factor index included items that were related to agricultural extension and education. Three items were identified under this factor index including: philosophy of agricultural extension and education (item 13), agricultural extension in the Third World (item 11), and curriculum development (item 12). Items loading heavily on the seventh factor index were closely related to the Cooperative Extension organization. These items included; internship in Cooperative Extension (item 25), history of the Cooperative Extension (item 28) and critical thinking (item 26). The eighth factor index included two items that were related to the international development programs and the process of leadership for social change. The items identified under this factor index included: implementation of international and rural development programs (item 15) and leadership (item 14).

Cronbach's' alpha for the factor indices identified on the need scale under this part ranged from .50 to .81.

Factor analysis was also used on the importance scale for the same twenty-eight items in this part. Eight factor indices were identified as shown in Table 36. The first factor index included: technology and social change in the Third World (item 23), rural community development issues (item 19), major world food issues (item 16), agricultural extension in the Third World (item 11), impact of technology on family

Table 36. Factors identified by factor analysis of twenty-eight items related the training needs of international graduate students of extension education (importance scale)

Variables	Item number	Factor loadings	Cronbach's alpha
Factor 1 (Technology and social system)			.80
Technology and social change in the Third World	23	.70725	
Rural community development issues	19	.68502	
Major world food issues	16	.60859	
Agricultural extension in the Third World countries	11	.60859	
Impact of technology on family	17	.58331	
Concepts and theories in rural sociology	21	.53674	
Diffusion and adoption of innovation	18	.43002	
Factor 2 (Research, analysis and programming)			.80
Research methodology	1	.80941	
Statistical methods	2	.80395	
Program evaluation	3	.7443	
Program planning	5	.51155	
Factor 3 (Agricultural and extension education)			.71
Philosophy of agricultural extension and education	13	.77316	
Curriculum development	12	.71102	
Needs assessment	24	.47022	
Factor 4 (Human resource development and management)			.74
Staff development	8	.72754	
Youth program management	9	.72432	
Administration	4	.70743	
Internship in cooperative extension	25	.45267	
Leadership	14	.39500	

Factor 5 (Cooperative education)			.72
Application of computers in educational settings	20	.68917	
Human behavior	27	.63813	
Critical thinking	26	.59524	
History of the Cooperative Extension	28	.52173	
Factor 6 (Teaching and learning process/communication)			.59
Adult education	7	.76028	
Teaching methods	6	.62543	
Communication theories and methods	22	.44043	
Factor 7 (Media)[a]			
Organizing presentation and media selection	10	.70887	
Factor 8 (International development)[b]			
Implementing international and rural development programs	15	.81811	

[a]Cronbach's alpha cannot be calculated for indices with one variable.

(item 17), concepts and theories in rural sociology (item 21), and diffusion and adoption (item 18). These items were closely related to rural community development and social change and similar to those items that were identified in this part under the need scale. The second factor index identified included items that were related to the scientific methods in the study of agricultural extension education and program planning and evaluation. The items under this factor index included: research methods (item 1), statistical methods (item 2), program evaluation (item 3), and program planning (item 5). The third factor index identified included the following items: philosophy of agricultural extension and education (item 13), curriculum development (item 12), and needs assessment (item 24). Human resource development and management and leadership was the focus of the fourth factor index. The items included under this factor index included: staff development (item 8), youth program management (item 9), administration (item 4), internship cooperative extension (item 25), and leadership (item 14). Four items were included under the fifth factor index. These included: application of computer in educational setting (item 20), human behavior (item 27), critical thinking (item 26) and the history of the Cooperative Extension (item 28). The sixth factor index included items that were closely to the teaching-learning process and communication. Items loading heavily on this factor index included: adult education theories (item 7), teaching methods (item 6), and communication theories and methods (item 22). The seventh factor index in this part included one item that was related to organizing presentation and media selection

(item 10). Similarly the eighth factor index included one item that was related to the implementation of international and rural development programs (item 15).

Cronbach's' alpha for the factor indices identified under part four on the importance scale ranged from .59 to .80. These reliabilities were considered satisfactory.

Analysis of covariance

The program MANOVA was used to examine relationships between groups' perceptions and their demographic characteristics. In each part of the survey instrument, the factor indices identified were handled as a set of multiple dependent variables in the analysis of variance. Demographic variables of the respondents (independent variables) included in this study consisted of nominal, ordinal and interval variables. The effects of these predicting variables on the dependent variables were studied together. Nominal and ordinal demographics were included as factors, interval demographics were controlled and included as covariates in the analysis.

In each separate analysis of variance performed, the regression analysis was studied to evaluate whether the variances in the covariates affected the association between groups' perceptions and factors. The multivariate tests of significance for each factor main effect and interactions were examined to test whether there were differences in groups' perceptions by factors and interactions. Whenever a multivariate tests, or interaction showed statistical significance, the univariate

F-tests of significance were examined to determine in which of the factor indexes the difference was concentrated.

Results from extension educators

The demographic variables of extension educators studied included the following. Nominal variables: gender, academic rank, and international experience. Interval variables: total years of work experience, total years of extension work experience, total years of teaching extension courses and age.

Because of the redundant effects, possibly caused by the missing cells in the analysis of variance, the third-order and some of the second-order interactions for the factors were not possible to obtain. A design specification was necessary to obtain the main effects and some of the second-order interaction of the three factors.

Agricultural extension program processes and practices The three factors indices identified earlier in this part (Table 32) were used in the analysis of variance as a set of dependent variables.

The results of the covariate analysis are shown in Table 37. The data show the standardized regression coefficients (beta), t-values and significance levels of the four covariates, for the three factor indices, all of which indicated that the effects of the covariates were not significant at α=0.05. Total years of work experience, total years of extension work experience, total years of teaching extension courses, and age of the extension educators had not impacted their perceptions toward the importance of agricultural extension program processes and practices.

Table 37. Analysis of variance among extension education of the factor indices of the agricultural extension program processes and practices

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.32129	1.469	.142

Regression analysis for within cells error term

Dependent Variable: Establishment of the institutional framework

Covariate	Beta	t-value	sig. of t
Total years of work experience	-.069	-.30	.769
Total years of extension work experience	.077	.48	.634
Total years of teaching extension courses	-.113	-.75	.458
Age	.388	1.74	.088

Dependent variable: Program determination

Covariate	Beta	t-value	sig. of t
Total years of work expense	.087	.36	.722
Total years of extension work experience	-.270	-1.64	.108
Total years of teaching extension courses	.238	1.53	.133
Age	.039	.17	.866

Dependent variable: Program strategy and action

Covariate	Beta	t-value	sig. of t
Total years of work experience	.195	.82	.416
Total years of extension work experience	.001	.01	.992
Total years of teaching extension courses	.168	1.09	.279
Age	-.408	-1.81	.077

Effect --- Academic rank by international experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.34816	1.072	.386

Effect --- Gender by academic rank
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.13871	1.192	.317

Effect --- International experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.16574	.955	.480

Table 37. Continued

Effect --- Academic rank Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.16379	1.427	.212
Effect --- Gender **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.07561	1.282	.292

The multivariate test of significance in Table 37, which measured whether groups differed significantly in their perceptions on the set of the dependent variables for the interaction effects of the extension educators academic rank by their international experience, showed an F-value of 1.07 and significance level of .39. This indicated that the effects of academic rank did not differ among extension educators with different international experience (α=.05). The data also indicated that the F-ratio for Pillai's trace for the multivariate test of significance for the interaction effects of gender by academic rank was 1.19 with significance level of .32. This result indicated that the effects of academic rank did not differ among assistant, associate, and full professor.

Data on the association between the perceptions of extension educators and their international experience indicated that the F-ratio for the multivariate test was .96 and the significance level was .48.

This was too high and statistically not significant. Pillai's trace for the multivariate test for the association between extension educators' academic rank and their perceptions was also not significant with an F-ratio of 1.43 and significance level of .21. The data also indicated that the F-ratio for the multivariate test for the association between extension educators' gender and their perceptions in this part was not significant at α=.05, with an F-ratio of 1.28 and significance level of .29.

Policies and characteristics Eight factor indices were identified earlier in this part (Table 33) and were included in the analysis of variance. The results of the analysis are shown in Table 38.

The data on the regression analysis of the four covariates for the forth factor index (government responsive organization) indicated that the covariates total years of work experience and total years of extension work experience were statistically significant at α=.05. The standardized regression coefficient (beta) (.583), t-value (2.63), and significance level (.011) of the covariate total years of work experience indicated that for extension educators with more years of work experience, the agreement score for this factor index was higher (higher score means stronger agreement to the idea). This result was a clear indication that more experienced extension educators tended to more strongly support the idea of a government responsive extension organization than less experienced extension educators. On the other hand, the

Table 38. Analysis of variance among extension educators of the factor indices of the selected policies and characteristics of the extension organizations

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.92076	1.607	.029

Regression analysis for within cells error term

Dependent Variable: Management of the organization

Covariate	Beta	t-value	sig. of t
Total years of work experience	-.435	01.92	.060
Total years of extension work experience	.279	1.82	.074
Total years of teaching extension courses	.242	1.70	.094
Age	.399	1.85	.071

Dependent variable: Organization guiding principles

Covariate	Beta	t-value	sig. of t
Total years of work expense	.249	1.02	.315
Total years of extension work experience	.072	0.43	.666
Total years of teaching extension courses	-.264	-1.72	.092
Age	-.131	-0.56	.578

Dependent variable: Policy control

Covariate	Beta	t-value	sig. of t
Total years of work experience	.268	1.09	.281
Total years of extension work experience	-.287	-1.73	.091
Total years of teaching extension courses	.044	.29	.774
Age	-.177	-.75	.454

Dependent Variable: Government responsive organization

Covariate	Beta	t-value	sig. of t
Total years of work experience	.583	2.63	.011*
Total years of extension work experience	-.471	-.314	.003*
Total years of teaching extension courses	.226	1.63	.110
Age	-.222	-1.06	.297

Dependent variable: Government-client responsive organization

Covariate	Beta	t-value	sig. of t
Total years of work expense	-.260	-1.03	.306
Total years of extension work experience	.086	.51	.615
Total years of teaching extension courses	-.090	-.57	.571
Age	.225	.94	.353

*Significant at the .01 level.

Table 38. Continued

Dependent variable: Organization performance stimulation			
Covariate	Beta	t-value	sig. of t
Total years of work experience	-.336	-1.35	.183
Total years of extension work experience	-.046	-.27	.786
Total years of teaching extension courses	.002	.01	.992
Age	.300	1.26	.214

Dependent Variable: Organization focus			
Covariate	Beta	t-value	sig. of t
Total years of work experience	-.300	-1.22	.229
Total years of extension work experience	-.161	-.97	.335
Total years of teaching extension courses	.099	.65	.521
Age	.394	1.68	.099

Dependent variable: Organization interface			
Covariate	Beta	t-value	sig. of t
Total years of work expense	.249	.99	.329
Total years of extension work experience	-.043	-.25	.803
Total years of teaching extension courses	-.032	-.20	.839
Age	-.132	-.55	.585

Effect --- Academic rank by international experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.85337	.933	.602

Effect --- Gender by academic rank
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.14623	.404	.978

Effect --- International experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.42783	.873	.637

Effect --- Academic rank
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.33906	1.05	.419

Effect --- Gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.08076	.439	.890

standardized regression coefficient (beta) (-.471), t-value (-3.14), and significance level (.003) of the covariate total years of extension experience were an indication that for extension educators with more years of extension work experience, the agreement score for the same factor index was lower. This means that more experienced extension educators in the area of extension tended to less support the idea of a government responsive extension organization than extension educators with less extension experience.

The data also indicated that none of the main or interaction effects of the three factors was statistically significant at α=.05.

Educational needs of the rural people The two factor indices that were identified earlier in this part were included in the analysis as a set of dependent variables. The results of the analysis are presented in Table 39.

The data results show the standardized regression coefficients (beta), their t-values, and significant levels of the four covariates, for the two factor indices, all of which indicated that the effects of the covariates were not significant at α=0.05.

The multivariate test of significance of whether the groups differed significantly in their perceptions on the set of the dependent variable for the interaction effects of academic rank by international experience, and the interaction effects of gender by academic rank indicated F-values of 1.5 and 1.4 and significance levels of .132 and .227, respectively.

Table 39. Analysis of variance among extension education of the factor indices of the educational needs of rural people

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.19513	1.433	.191

Regression analysis for within cells error term

Dependent Variable: Knowledge to acquire scientific consciousness

Covariate	Beta	t-value	sig. of t
Total years of work experience	.039	.17	.869
Total years of extension work experience	.079	.50	.619
Total years of teaching extension courses	-.273	-1.88	.066
Age	.117	.53	.599

Dependent variable: Knowledge to acquire social and political consciousness

Covariate	Beta	t-value	sig. of t
Total years of work expense	-.071	-.31	.761
Total years of extension work experience	.120	.77	.446
Total years of teaching extension courses	.241	1.67	.101
Age	.049	.22	.826

Effect --- Academic rank by international experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.29194	1.510	.132

Effect --- Gender by academic rank
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.10293	1.438	.227

Effect --- International experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.24081	2.418	.031*

Effect --- Academic rank
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.10902	1.528	.199

Effect --- Gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.05755	1.588	.214

These results suggested that both the interactions were not statistically significant at α=.05.

Data on the main effects of the extension educators' international experience on their perceptions in this part indicated an F-ratio of 2.4 and a significance level of .03 for the multivariate test. This level was statistically significant at α=.05. Further examination of the univariate F-tests of significance revealed that the difference in the effects of extension educators' international experience were concentrated in their perceptions toward the first dependent variable, namely, knowledge to acquire scientific consciousness. The data in Table 38 also indicated that the multivariate test of significance for the main effects of extension educators' academic rank and gender were not significant at α=.05.

Needs for skills and training items Eight factor indices were identified earlier in this part (Table 34) and used in the analysis. The results are shown in Table 40.

The results on the regression analysis of the four covariates for the first factor index (technology and social systems) indicated that the covariate age was statistically significant at α=.05. The standardized regression coefficient (-.545), t-value (-2.17), and significance level (.035) of the covariate age indicated that for extension educators with higher age, the felt need score was lower for the factor index (lower score means not needed). This result suggests that older extension educators tended to feel less need for training in the factor index

Table 40. Analysis of variance among extension educators of the factor indices of the need for skills and training items

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.80764	1.391	.093

Regression analysis for within cells error term

Dependent Variable: Technology and social systems

Covariate	Beta	t-value	sig. of t
Total years of work experience	.528	1.96	.056
Total years of extension work experience	.059	.36	.722
Total years of teaching extension courses	.104	.69	.494
Age	-.545	-2.17	.035*

Dependent variable: Teaching and learning process

Covariate	Beta	t-value	sig. of t
Total years of work expense	.262	1.04	.302
Total years of extension work experience	.491	3.17	.003*
Total years of teaching extension courses	-.144	-1.02	.312
Age	-.357	-1.52	.134

Dependent variable: Program planning and evaluation

Covariate	Beta	t-value	sig. of t
Total years of work experience	.051	.18	.860
Total years of extension work experience	.139	.79	.435
Total years of teaching extension courses	.009	.05	.957
Age	-.063	-.24	.814

Dependent Variable: Human resource development and management

Covariate	Beta	t-value	sig. of t
Total years of work experience	-.104	-.37	.713
Total years of extension work experience	-.121	-.70	.487
Total years of teaching extension courses	.259	1.65	.106
Age	.021	.08	.936

Dependent variable: Research methodology and statistics

Covariate	Beta	t-value	sig. of t
Total years of work expense	.403	1.43	.158
Total years of extension work experience	.050	.29	.773
Total years of teaching extension courses	-.069	-.44	.664
Age	-.358	-1.36	.179

*Significant at the .01 level.

Table 40. Continued

Dependent variable: Agricultural and extension education			
Covariate	Beta	t-value	sig. of t
Total years of work experience	-.698	-2.69	.010*
Total years of extension work experience	-.103	.644	.523
Total years of teaching extension courses	.140	.964	.340
Age	.445	1.83	.073

Dependent Variable: The Cooperative Extension			
Covariate	Beta	t-value	sig. of t
Total years of work experience	-.142	-.52	.607
Total years of extension work experience	.250	1.48	.146
Total years of teaching extension courses	-.066	-.43	.670
Age	-.184	-.72	.476

Dependent variable: Leadership for social change			
Covariate	Beta	t-value	sig. of t
Total years of work expense	-.092	-.33	.743
Total years of extension work experience	.205	1.19	.239
Total years of teaching extension courses	-.108	.69	.494
Age	.236	.91	.369

Effect --- Academic rank by international experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.99091	1.137	.260

Effect --- Gender by academic rank
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.25005	.750	.735

Effect --- International experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.61520	1.387	.126

Effect --- Academic rank
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.25111	.754	.731

Effect --- Gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.09127	.515	.838

(technology and social systems) for their international graduate students than younger extension educators.

For the second factor index (teaching and learning process), the standard regression coefficient (beta) (.491), t-value (3.17), and significance level (.003) indicated that the covariate total years of extension work experience was statistically significant at α=.05. These data suggest that for extension educators with more years of extension work experience, the felt need score was higher. This result indicated that experienced extension educators in the area of extension tended to feel the need for training in the factor index (teaching and learning process) for their international graduate students more than did extension educators with less extension experience. The data of the regression analysis also show that for the sixth factor index (agricultural and extension education), the standardized regression coefficient (beta) (-.698), t-value (-2.69) and significance level (.01) for the covariate total years of work experience indicated statistical significance at α=.05. This result indicated that for extension educators with more years of work experience, the felt need score was lower. This was a clear indication that more experienced extension educator tended to feel less the need for training in the factor index (agricultural and extension educators) for their international graduate students. Table 40 also shows the multivariate tests of significance for the main and interaction effects of the three factor. None of the results indicated statistical significant at α=.05.

Importance of the skills and training items Eight factor indices were identified earlier in this part (Table 36) and were used in the analysis. The results are shown in Table 41.

The data on the regression analysis show that for the sixth factor index (teaching and learning) the regression coefficient (beta) (.446), t-value (2.97), and significance level (.005) for the covariate total years of extension experience was statistically significant at α=.05. This result indicated that for extension educators with more extension experience, the felt importance score was higher (high score means more importance). This suggested that experienced extension educators in the area of extension tended to more feel the importance of the factor index (teaching and learning process) to be included in curriculum intended for international graduate students more than did extension educators with less extension experience. Data on the same factor for the covariate age indicated that the standardized coefficient (beta) (-.455), t-value (-2.15), and significance level (.037). This result was statistically significant at α=.05. This result indicated that for older extension educators, the felt importance score was lower. This suggest that older extension educators tended to feel less the importance of the factor index (teaching and learning process) to be included in curriculum intended for international graduate students.

Table 41 also presents the multivariate tests of significance for the interactions and main effects of the three factors. For the interaction effect of academic rank by international experience, it can be seen from the Pillai's trace that the effect of academic rank differ among

Table 41. Analysis of variance among extension education students of the factor indices of the importance of skills and training items

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.64004	1.072	.375

Regression analysis for within cells error term

Dependent Variable: Technology and social systems

Covariate	Beta	t-value	sig. of t
Total years of work experience	.241	.95	.346
Total years of extension work experience	-.071	-.42	.675
Total years of teaching extension courses	.103	.67	.504
Age	-.334	-1.41	.166

Dependent variable: Research, analysis and programming

Covariate	Beta	t-value	sig. of t
Total years of work expense	-.072	-.29	.775
Total years of extension work experience	.083	.50	.618
Total years of teaching extension courses	.153	1.00	.319
Age	.202	.86	.393

Dependent variable: Agricultural and extension education

Covariate	Beta	t-value	sig. of t
Total years of work experience	-.291	-1.15	.257
Total years of extension work experience	-.079	-.47	.640
Total years of teaching extension courses	.055	.36	.720
Age	.158	.67	.509

Dependent Variable: Human resource development and management

Covariate	Beta	t-value	sig. of t
Total years of work experience	-.055	.21	.830
Total years of extension work experience	-.194	-1.15	.257
Total years of teaching extension courses	.195	1.27	.211
Age	.057	.24	.812

Dependent variable: Cooperative education

Covariate	Beta	t-value	sig. of t
Total years of work expense	-.105	-.43	.671
Total years of extension work experience	.156	.96	.342
Total years of teaching extension courses	.024	.16	.871
Age	-.268	-1.16	.251

*Significant at the .05 level.

**Significant at the .05 level.

Table 41. Continued

Dependent variable: Teaching and learning process Covariate	Beta	t-value	sig. of t
Total years of work experience	.325	1.44	.157
Total years of extension work experience	.446	2.97	.005*
Total years of teaching extension courses	-.074	-.54	.593
Age	-.455	-2.14	.037*

Dependent Variable: Media Covariate	Beta	t-value	sig. of t
Total years of work experience	.171	.67	.506
Total years of extension work experience	-.130	-.77	.447
Total years of teaching extension courses	.012	.07	.945
Age	.063	.26	.792

Dependent variable: International development Covariate	Beta	t-value	sig. of t
Total years of work expense	.082	.33	.743
Total years of extension work experience	.232	1.41	.166
Total years of teaching extension courses	-.162	-1.08	.287
Age	.073	.31	.754

Effect --- Academic rank by international experience
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	1.17776	1.434	.040*

Univariate F-tests of significance with (6, 49) D.F.

Variable	Hypothesis MS	Error MS	F	sig. of F
Technology and social systems	1.04930	.90118	1.164	.341
Research, analysis and programming	3.21266	.62015	5.181	.000**
Agricultural and extension education	1.68246	1.30786	1.286	.281
Human resource development and management	1.25729	.96123	1.308	.271
	.80822	.65584	1.232	.306
Teaching and learning process	1.05454	.17131	1.470	.208
Media	1.33529	.76115	1.754	.128
International development	.70912	.92733	.765	.601

Effect --- Gender by academic rank
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.24844	.762	.722

Table 41. Continued

Effect --- International experience			
Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.58938	1.344	.148
Effect --- Academic rank			
Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.29584	.933	.535
Effect --- Gender			
Multivariate tests of significance			
Test name	Value	Exact F	Sig. of F
Pillai's	.16247	1.018	.437

extension educators in the different categories of international experience at α=.05. The univariate F-tests of significance indicated that the difference in the effect of academic rank by international experience is concentrated in the perceptions toward the second factor index (research, analysis and programming). None of the other interactions or main effect indicated statistical significance.

Results from international graduate students

The demographic characteristics of the international graduate students studied included nominal, ordinal, and interval variables. The nominal and ordinal demographics included: home origin, gender, place where earned master's degree, place where earned bachelor's degree, degree program, extension work experience in home country, and extension experience in the United States. The interval demographics included:

years of extension experience at home country, years of extension experience in the United States, years spent studying in the United States, and age.

Because of the missing cells, third-order and some of the second-order interactions were not possible to obtain. The factor extension experience in the United States was excluded from the analysis for the same reason. A design specification was necessary to obtain the interactions and main effects of the remaining factors. Results in each part will be presented in the same order presented for extension educators.

Agricultural extension program processes and practices The results of the analysis of variance for the three factor indices in this part are presented in Table 42. Data on regression analysis of the four covariates for the first factor index (establishment of institutional framework) indicated that the covariate years of extension work experience in home country was statistically significant at α=.05. The standardized regression coefficient (beta) (-.436), t-value (-2.05), and significance level (.05) indicated that for international graduate students with more years of extension work experience in their home countries, the importance score was lower (a lower score meant less felt importance). This result suggests that international graduate students with more extension work experience in extension in their home countries tended to less feel the importance of the factor index (establishment of

Table 42. Analysis of variance among international graduate students of the factor indices of the agricultural extension program processes and practices

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.42709	1.120	.356

Regression analysis for within cells error term

Dependent Variable: Establishment of the institutional framework

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.436	-2.05	.050*
Total years of extension experience (U.S.)	.158	.85	.405
Years spent studying in the U.S.	-.165	-.84	.408
Age	.124	.60	.556

Dependent variable: Program determination

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.027	.132	.896
Total years of extension experience (U.S.)	-.225	-1.263	.217
Years spent studying in the U.S.	-.192	-1.028	.313
Age	.347	1.753	.091

Effect --- Home origin by extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.19286	.925	.485

Effect --- Home origin by gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.25307	1.256	.294

Effect --- Extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.11077	1.038	.393

Effect --- Place where earned Master's degree
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.02287	.195	.899

Table 42. Continued

Effect --- Place where earned Bachelor's degree Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.03302	.285	.836
Effect --- Gender **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.11174	1.048	.389
Effect --- Degree program **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.11197	.514	.795
Effect --- Home origin **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.19681	.946	.471

institutional framework) than international graduate students with less or no experience.

Results for the multivariate tests of significance for the interactions and main effects of the six factors indicated that none of the effects was statistically significant at α=.05.

Policies and characteristics of the extension organization The results of the analysis of variance for the eight factor indices in this part are presented in Table 43. The data on the regression analysis of the four covariates for the fifth factor index (government/client responsive organization) indicated that the covariate years spent studying in the United States was statistically significant at

Table 43. Analysis of variance among international graduate students of the factor indices of the policies and characteristics of the extension organization

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	1.19569	.906	.612

Regression analysis for within cells error term

Dependent Variable: Management of the organization

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.151	.52	.607
Total years of extension experience (U.S.)	-.131	-.53	.600
Years spent studying in the U.S.	-.365	-1.73	.098
Age	-.074	-.26	.799

Dependent variable: Organization guiding principles

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.070	.23	.822
Total years of extension experience (U.S.)	-.120	-.46	.652
Years spent studying in the U.S.	-.152	-.68	.505
Age	-.286	-.94	.358

Dependent Variable: Policy control

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.099	.35	.729
Total years of extension experience (U.S.)	-.217	-.90	.376
Years spent studying in the U.S.	-.254	-1.24	.228
Age	.192	.69	.499

Dependent variable: Government responsive organization

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.130	.474	.641
Total years of extension experience (U.S.)	-.063	-.271	.789
Years spent studying in the U.S.	-.091	-.459	.651
Age	.395	1.461	.159

Dependent Variable: Government-client responsive organization

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.258	-.97	.341
Total years of extension experience (U.S.)	.451	2.00	.059
Years spent studying in the U.S.	-.444	-2.31	.031*
Age	.057	.22	.828

Table 43. Continued

Dependent variable: Performance stimulation Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.268	.91	.372
Total years of extension experience (U.S.)	-.105	-.42	.678
Years spent studying in the U.S.	.392	1.83	.081
Age	-.029	-.10	.921

Dependent Variable: Organization focus Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.131	-.43	.669
Total years of extension experience (U.S.)	.235	.91	.372
Years spent studying in the U.S.	-.290	-1.32	.201
Age	-.190	.64	.531

Dependent variable: Organization interface Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.095	.30	.768
Total years of extension experience (U.S.)	-.042	-.16	.877
Years spent studying in the U.S.	.088	.38	.707
Age	-.019	-.06	.952

Effect --- Home origin by extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.71966	1.054	.435

Effect --- Home origin by gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.74168	1.105	.393

Effect --- Extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.38511	1.096	.420

Effect --- Place where earned Master's degree
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.23155	.527	.817

Effect --- Place where earned Bachelor's degree
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.46406	1.515	.237

Table 43. Continued

Effect --- Gender Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.36371	1.000	.477
Effect --- Degree program **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.78003	1.199	.324
Effect --- Home origin **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.62356	.849	.626

α=.05. The standardized regression coefficient (beta) (-.444), t-value (-2.31), and significance level (.031) for the covariate suggested that for international graduate students with more years spent studying in the United States, the agreement score was lower for the factor index government/client responsive organization. This was an indication that international graduate students with longer studying period in the United States tended to be less supportive to the ideas of the factor index (government/client responsive organization) than students with shorter studying periods in the United States.

Results of the multivariate tests of significance for the interactions and main effects of the six factors indicated no statistical significance at α=.05.

Educational needs of the rural people The results of the analysis for the two factor indices in this part are presented in Table 44.

Data on the regression analysis of the four covariates and the multivariate tests of significance for the interactions and main effects of the six factors showed no statistical significance at α=.05.

Need for skills and training items The results of the analysis for the eight factor indices in this part are presented in Table 45. Data on the regression analysis of the four covariates and the multivariate tests of significance for the interactions and main effects of the six factor showed no statistical significance.

Importance of skills and training items The result of the analysis for the eight factor indices in this part are presented in Table 46. The data on the regression analysis of the four covariates indicated that none of the covariate had impacted the perceptions of international graduate students in this part.

From the results of the multivariate tests of significance it can be seen that from the level of significance of Pillai's trace (.051) that the main effect of international graduate students degree program was statistically significant at α=.05. The univariate F-tests of significance revealed that the effects of the factor degree program were concentrated on the importance of the second factor index (research, analysis and programming).

Table 44. Analysis of variance among international graduate students of the factor indices of the educational needs of rural people

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.14350	.541	.821

Regression analysis for within cells error term

Dependent Variable: Knowledge to acquire scientific consciousness

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.153	.69	.493
Total years of extension experience (U.S.)	.225	1.17	.253
Years spent studying in the U.S.	-.107	-.53	.601
Age	-.120	-.56	.581

Dependent variable: Knowledge to acquire social and political consciousness

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.022	.10	.922
Total years of extension experience (U.S.)	.071	.37	.715
Years spent studying in the U.S.	.244	1.21	.238
Age	-.046	-.22	.830

Effect --- Home origin by extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.20929	1.636	.178
Hotelling's	.23504	1.528	.208
Wilk's	.80120	1.582	.192

Effect --- Home origin by gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.04935	.354	.840

Effect --- Extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.02171	.300	.744

Effect --- Place where earned Master's degree
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.04610	.652	.529

Table 44. Continued

Effect --- Place where earned Bachelor's degree
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.06685	.967	.393

Effect --- Gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.08415	1.240	.305

Effect --- Degree program
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.25802	2.074	.096

Effect --- Home origin
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.03523	.251	.908

Table 45. Analysis of variance among international graduate students of the factor indices of the need for skills and training items

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.66211	.521	.980

Regression analysis for within cells error term

Dependent Variable: Technology and social systems

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.286	-1.25	.223
Total years of extension experience (U.S.)	.215	1.07	.297
Years spent studying in the U.S.	-.037	-.17	.864
Age	-.095	-.43	.670

Dependent variable: Teaching and learning process

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.053	.21	.827
Total years of extension experience (U.S.)	.214	1.01	.320
Years spent studying in the U.S.	-.059	-.26	.794
Age	-.219	-.95	.350

Dependent Variable: Program planning and evaluation

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.326	-1.36	.186
Total years of extension experience (U.S.)	.019	.09	.929
Years spent studying in the U.S.	-.167	-.75	.463
Age	.142	.62	.544

Dependent variable: Human resource development and management

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.150	-.64	.530
Total years of extension experience (U.S.)	-.108	-.52	.608
Years spent studying in the U.S.	.161	.73	.474
Age	-.138	.62	.550

Dependent Variable: Research methodology and statistics

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.062	.26	.800
Total years of extension experience (U.S.)	.057	.27	.792
Years spent studying in the U.S.	-.138	.60	.554
Age	.062	-.26	.794

Table 45. Continued

Dependent variable: Agricultural and extension education

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.275	-1.18	.250
Total years of extension experience (U.S.)	.323	1.57	.129
Years spent studying in the U.S.	-.232	-1.06	.300
Age	.146	.65	.519

Dependent Variable: The Cooperative extension

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.329	-1.42	.169
Total years of extension experience (U.S.)	.293	1.43	.165
Years spent studying in the U.S.	-.256	-1.17	.252
Age	.151	.67	.506

Dependent variable: Leadership for social change

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.066	-.27	.793
Total years of extension experience (U.S.)	-.032	-.15	.883
Years spent studying in the U.S.	-.087	-.37	.711
Age	-.000	-.00	1.000

Effect --- Home origin by extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.67188	1.202	.311

Effect --- Home origin by gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.62146	1.071	.413

Effect --- Extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.29059	.922	.522

Effect --- Place where earned Master's degree
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.22962	.671	.711

Effect --- Place where earned Bachelor's degree
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.33860	1.152	.378

Table 45. Continued

Effect --- Gender			
Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.44709	1.819	.139
Effect --- Degree program			
Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.59570	1.007	.470
Effect --- Home origin			
Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.55107	.903	.571

Table 46. Analysis of variance among international graduate students of the factor indices of the importance of skills and training items

Effect --- Within cells regression
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.96357	.714	.853

Regression analysis for within cells error term

Dependent Variable: Technology and social systems

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.177	-.74	.465
Total years of extension experience (U.S.)	.083	.38	.708
Years spent studying in the U.S.	.078	.34	.738
Age	.044	.19	.851

Dependent variable: Research, analysis and programming

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.029	-.12	.906
Total years of extension experience (U.S.)	.096	.42	.675
Years spent studying in the U.S.	-.019	-.08	.935
Age	.068	.29	.775

Dependent Variable: Agricultural and extension education

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.228	-1.06	.302
Total years of extension experience (U.S.)	.402	2.01	.057
Years spent studying in the U.S.	-.365	-1.76	.093
Age	.123	.592	.560

Dependent Variable: Human resource development and management

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.100	-.42	.677
Total years of extension experience (U.S.)	-.000	-.00	.999
Years spent studying in the U.S.	-.017	-.08	.940
Age	-.191	-.83	.415

Dependent Variable: Cooperative education

Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.002	.02	.992
Total years of extension experience (U.S.)	.211	.96	.347
Years spent studying in the U.S.	-.028	-.12	.904
Age	.179	.78	.444

Table 46. Continued

Dependent variable: Teaching and learning process Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.137	-.59	.564
Total years of extension experience (U.S.)	.065	.30	.768
Years spent studying in the U.S.	-.089	-.39	.697
Age	-.191	-.85	.407

Dependent Variable: Media Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	.179	.75	.464
Total years of extension experience (U.S.)	.061	.27	.788
Years spent studying in the U.S.	.020	.09	.932
Age	.021	.09	.930

Dependent variable: International development Covariate	Beta	t-value	sig. of t
Total years of extension experience (home)	-.423	-1.93	.067
Total years of extension experience (U.S.)	-.054	-.26	.794
Years spent studying in the U.S.	-.311	-1.47	.155
Age	.031	.14	.887

Effect --- Home origin by extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.97600	1.906	.060

Effect --- Home origin by gender
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.87138	1.544	.144
Hotelling's	1.73277	1.517	.163
Wilk's	.30235	1.535	.151

Effect --- Extension work experience (home)
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.27572	.714	.677
Hotelling's	.38068	.714	.677
Wilk's	.72428	.714	.677

Effect --- Place where earned Master's degree
Multivariate tests of significance

Test name	Value	Approx. F	Sig. of F
Pillai's	.32107	.887	.550
Hotelling's	.47291	.887	.550
Wilk's	.67893	.887	.550

Table 46. Continued

Effect --- Place where earned Bachelor's degree Multivariate tests of significance			
Test name	Value	Approx. F	Sig. of F
Pillai's	.53204	2.132	.098
Effect --- Gender **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.52154	2.044	.111
Effect --- Degree program **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.99183	1.968	.051*
Effect --- Home origin **Multivariate tests of significance**			
Test name	Value	Approx. F	Sig. of F
Pillai's	.53393	.728	.746

Kouzekanani (1983) studied the correlation between demographic characteristics of extension educators and international graduate students and their perceptions toward agricultural extension program processes, policies and characteristics of the extension organizations, educational needs of rural people, and training needs of international graduate students. Extension educators' demographics included: academic rank, gender, years of work experience, years of teaching extension education, overseas experience, and age. International graduate students' demographics included: home continent, degree program, years studying in the United States, place received master's degree, place

received bachelor's degrees, years of experience in extension, gender, and age. Kouzekanani (1983) reported that all correlation coefficients fell in the negligible and low relationship between groups' perceptions the four areas and their demographic characteristics. The author concluded that none of the demographic studied impacted groups' perceptions toward extension education in the Third World.

Major Findings

The results of the statistical analyses related to the objectives of this research were presented in this chapter. The followings summarize the major findings.

Demographics

1. Twenty-four percent of the extension educators surveyed were assistant professors, 31% were associate professors, and 42% were full professors.
2. The proportion of female and male extension educators surveyed was .09 and .91, respectively.
3. Thirty-five percent of the extension educators surveyed were in the southern region, 24% were in the north eastern, about 17% were in the western and 24% were in the north central regions of the United States.
4. Most of the extension educators were between 30 and 60 years old (72%).
5. The majority of the extension educators had acquired between 11 and 40 years of work experience (74%), 10 or more years of extension

work experience (90%), taught extension courses for 20 years or less (85%), and acquired some kind of international experience (68%).

6. More than half of extension educators surveyed had worked with international graduate student advisees (57%).
7. The proportion of African, Asian, and Latin American international graduate students studying extension education in the United States was .45, .34, and .21 respectively.
8. The international graduate students represented 44 countries in Africa, Asia, and Latin America.
9. The proportion of female and male international graduate students studying extension education in the United States was .26 to .74.
10. Most of the international graduate students of extension education in the United States were between 25 and 44 years old (94%).
11. Thirty-four percent of the international graduate students surveyed were master's students and about 65% were doctoral students.
12. The majority of the international graduate students studying extension education in the United States received their bachelor's degrees from institutions outside the United States (80%) and their master's degrees from institutions in the United States (78%).
13. Most of the international graduate students of extension education surveyed spent between 1 and 3 years studying in the United States (61%).
14. The majority of the international graduate students studying extension education in the United States had acquired some kind of extension work experience in their home countries (75%).

15. The majority of the international graduate students of extension education in the United States had not acquired any practical extension experience in the United States (85%).
16. More than half of the international graduate students of extension education surveyed were in the north central region (56%), less than one-fourth were in the north eastern region, 9% were in the western region, and about 11% were in the southern region of the United States.

Perceptions of respondents

17. Extension educators and international graduate students agreed that all fifteen processes and practices of the agricultural extension program were important to be performed by extension program planners in Africa, Asia, and Latin America. Both groups perceived the following two processes and practices were "extremely important:"
    (a) analyze situations, concerns, interests, and needs of the clients.
    (b) formulate realistic and meaningful program goals.
18. Significant differences were found to exist between extension educators and international graduate students ratings of the level of importance on 4 out of the 15 processes and practices of the agricultural extension program. Extension educators' mean score(s):
    (a) were significantly higher than that of international graduate students on the item: state clearly the philosophy of their extension program.

(b) were significantly lower than that of international graduate students' on the items: understand relationships among national and international agencies involved in the agricultural knowledge system, use survey methods to seek information, and analyze, interpret data derived from survey.

19. The Spearman correlation coefficient (rho) that measured the agreement between extension educators and international graduate students mean scores rankings of the fifteen processes and practices of agricultural extension program was .91.

20. Both the extension educators and the international graduate students in their perceptions toward policies and characteristics of the agricultural extension organization in Africa, Asia, and Latin America:

(a) strongly agreed that the organization should:

- focus on increasing the capacity of people

(b) agreed that the organization should:

- have a clearly stated educational philosophy and mission.
- be involved in educational duties.
- function according to its own philosophy.
- derive its mission from the national policies.
- have its priorities based on research findings.
- have its priorities based on number of farmers affected.
- have its priorities based on availability of human resources.
- operate under policies established by a combination of the government, the clientele, and the international agencies.

- operated under policies established by the government and the clientele.
- be funded by a combination of the central government and local sources.
- be within the university.
- focus on technology.
- use a bottom-up approach to program development.

(c) rejected that the organization should:

- be within the Ministry of Education.
- use a top-down approach to program development.
- operate under policies established by the international agencies.

21. Significant differences were found between extension educators and international graduate students perceptions for 6 out of 27 policies and characteristics of the extension organizations.

(a) Extension educators' mean scores were significantly lower than that of international graduate students:

- in their rejection of the ideas that the organization should enforce government production goals.
- in their indecision about the idea that the organization should be within the Ministry of Agriculture.
- in their rejection of the idea that the organization should be involved in educational and non-educational duties.

(b) Extension educators' mean scores were significantly higher than the international graduate students' mean scores:

- in their support of the ideas that the organization should have a clearly stated educational philosophy and clearly states educational mission.
- in their support of the idea that the organization should be involved in educational duties.
- in their rejection of the idea that the organization should operate under policies established by international agencies.

22. Regarding their perceptions toward the educational needs of rural people, both extension educators and international graduate students:

(a) agreed that agricultural extension organizations in Africa, Asia, and Latin America ought to fulfill rural people's education needs on:

- application of new inputs, varieties, and improved farm practices.
- application of new and improved practices related to livestock.
- food storage, processing and preservation.
- family improvement skills knowledge (e.g., health care and nutrition).
- civic skills (e.g., how cooperatives work).
- farm maintenance skills.
- farm business management.

(b) were undecided about whether the organization ought to fulfill the general and basic educational needs of the rural people (e.g., reading and writing).

23. Both extension educators and international graduate students perceived that all the twenty-eight training items were needed by international graduate students and important to be included in curricula intended for them. According to the data:

(a) extension educators and international graduate students perceived the following training items "very much needed" by international graduate students and "very important" to be included in curricula intended for them:

- program planning.
- program evaluation.
- teaching methods.
- needs assessment.
- rural community development issues.
- diffusion and adoption of innovations.
- leadership.
- research methodology.
- adult education theories.
- communication theories and methods.
- implementation of international and rural development programs.
- agricultural extension in the Third World countries.
- critical thinking.
- technology and social change in the Third World countries.
- philosophy of agricultural and extension education.
- organizing presentations and media selection.
- human behavior.

- curriculum development.
- staff development.
- administration.
- internship in Cooperative Extension.

(b) extension educators and international graduate students perceived the following items to be "needed" by international graduate students and "important" to be included in curriculum intended for them:

- statistical methods.
- concepts and theories in rural sociology.
- major world food issues.
- impact of technology on family.
- application of computers in educational settings.
- history of the Cooperative Extension.

24. Significant differences were found to exist in the ratings of extension educators and international graduate students on the level of need for 11 out of 27 training items.

(a) Extension educators' mean scores were significantly lower than that of international graduate students on the items: research methodology, statistical methods, administration, agricultural extension in the Third World countries, major world food issues, impact of technology on family, application of computer in educational settings, concepts and theories in rural sociology, technology and social change in the Third World countries, and rural community development issues.

(b) Extension educators' mean score was significantly higher on the item, teaching methods.

25. Significant differences were found to exist in extension educators' and international graduate students' ratings on the level of importance for 10 out of 27 training items.

(a) Extension educators' mean scores were significantly lower than that of international graduate students on the items: research methodology, statistical methods, administration, agricultural extension in the Third World, impact of technology on family, rural development issues, application of computers in educational settings, concepts and theories in rural sociology, and technology and social change in the Third World.

(b) Extension educators' mean score was significantly higher on the item, teaching methods.

Relationships between demographics and perceptions

26. Analysis of variance on each part by the demographic characteristics of the respondents revealed that:

(a) Experienced extension educators:

(i) were more supportive to the factor index, "government responsive organization."

(ii) felt less need for international graduate training in the factor index, "teaching and learning process."

(iii) felt less importance of the factor index, "teaching and learning process" to be included in curricula intended

for international graduate students of extension education.

(b) Experienced extension educators in the area of extension:
   (i) were less supportive to the factor index, "government responsive organization."
   (ii) felt more need for international graduate students in the factor index, "teaching and learning process."

(c) Older extension educators:
   (i) felt less need for international graduate training in the factor index, "technology and social systems."
   (ii) felt less importance of the factor index, "teaching and learning process" to be included in a curriculum for international graduate students.

(d) International graduate students who acquired more work extension experience in their home countries felt less the importance of the factor index, "establishment of institutional framework."

(e) International graduate students with longer studying periods in the United States were found to be less supportive to the factor index, "government-client responsive organization."

(f) A significant difference was found between master's, doctoral, and post-doctoral international graduate students in their perceptions toward the importance of including the factor index, "research, analysis, and programming" in a curriculum intended for international graduate students of extension education.

CHAPTER V: SUMMARY, CONCLUSIONS, AND RECOMMENDATION

This chapter consists of a summary of this study. The major focus of this study was on extension education in the context of the Third World. The research objectives were to:

1. describe characteristics of extension educators and international graduate students of extension education studying in the United States.
2. document the perceptions of extension educators and international graduate students regarding selected characteristics and policies of the extension organization outside the United States.
3. document perceptions of extension educators and international graduate students toward what educational needs of rural people an extension organization ought to fulfill.
4. document perceptions of extension educators and international graduate students toward agricultural extension processes and practices and some of the training needs of the international graduate students studying in the United States.
5. determine if there were differences between perceptions of extension educators and international graduate students toward agricultural extension program processes and practices, policies and characteristics of extension organizations outside the United States, educational needs of rural people, and training needs of international graduate students of extension education.

6. determine the relationships between characteristics of extension educators and international graduate students and their perceptions of extension education outside the United States.

Analysis of Data

Data used in the analysis were compiled from 159 questionnaires. The data were analyzed using frequencies, measures of central tendency, measures of variations, and measures of relationships. Factor analysis was used to regroup the interrelated items in each part of the survey instrument. Factor scores were saved and used for the analysis of variance by demographic characteristics. Spearman correlation coefficient rho was used to detect the relationship between groups' mean score rankings and t-tests were used to investigate possible differences between extension educators and international graduate students.

Summary of Findings

The typical extension educator respondent was a 48 year-old man who was a full professor, had about 25 years of total work experience, 16 years of extension work experience, taught extension courses for about nine years, acquired some kind of international experience, and teaching in school in the southern region of the United States.

The typical international graduate students of extension education studying in the United States was a 35 year-old, African, doctoral male student, had about 5 years of extension work experience, received a bachelor's degree at his home country, a master's in the United States,

spent three years studying in the United States, and studying in school in the north central region of the United States.

Both extension educator and international graduate student respondents perceived that it was important for extension program planners in Africa, Asia, and Latin America to be able to perform all the fifteen processes and practices of the agricultural extension program. Both groups placed an emphasis on the importance of the establishment of the institutional framework. Although there was strong agreement between the two groups in their mean score rankings, significant differences were found in their ratings of the level of importance of 4 out of 15 processes and practices.

Both extension educators and international graduate students supported that the agricultural extension organizations in Africa, Asia, and Latin America should maintain an educational philosophy, mission, and duties; focus on increasing the capacity of the people; be within the university; use a bottom-up approach to program development; be funded by a combination of central government and local sources; have its priorities based on research findings, availability of human resources, and number of farmers affected; and operate under policies established by a combination of the government, clientele, and international agencies. The two groups rejected that extension organizations use a top-down approach to program development; operate under policies established by international agencies; and be within the Ministry of Education. Significant differences were found between the two groups in their ratings of level of agreement/disagreement on 6 of 27 policies and

characteristics of extension organizations outside the United States.

Extension educators and international graduate students agreed that the extension organization in Africa, Asia, and Latin America ought to fulfill rural people educational needs on: application of new inputs, varieties, and improved farm practices; application of new and improved practices related to livestock; food storage, processing, and preservation; family improvement skills; civic skills; farm maintenance skills; and farm business management. However, both groups remained undecided about whether the agricultural extension organization ought to fulfill rural people basic and general educational needs.

Extension educators and international graduate students perceived that all the twenty-eight training items were needed by international graduate students and important to be included in curricula intended for them. Significant differences were found in the extension educators and international graduate students ratings of the level of need and level of importance on 10 out of the 28 training items.

Analysis of variance revealed several significant relationships between extension educators' perceptions and their characteristics. These included total years of work experience, total years of extension vwork experience, age, and academic rank. Relationships were also found to exist between international graduate students perceptions and their total years of extension work experience in home country, years spent studying in the United States, and degree program.

Conclusions

The following conclusions can be drawn based on findings derived from this study of extension educators and international graduate students of extension education perceptions of extension education in Africa, Asia, and Latin America.

1. Enrollment of international graduate students of extension education in the United States was comprised predominantly of male students; however, the data indicated that the number of female students enrolled had increased over the last ten years.
2. Extension educators in the United States universities were found to possess sufficient extension and teaching experience.
3. Extension educators and international graduate students agreed that it was important for extension program planners in Africa, Asia, and Latin America to be able to perform all fifteen agricultural extension program processes and practices. Both groups perceived that the processes and practices related to the establishment of institutional framework were of extreme importance.
4. This study supported Claar et al. (1983) and Claar (1984) proposals to adapt and adopt the Cooperative Extension Service model to the Third World countries. Both extension educators and international graduate students in this study supported the concepts that the agricultural extension organizations in Africa, Asia, and Latin America should be primarily educational in nature, have the freedom and orientation to empower and help clientele solve their problems and satisfy their needs, have a high degree of local involvement in

both financing and control, and be less oriented to satisfy government production goals.

5. Extension educators and international graduate students agreed that the agricultural extension organizations in Africa, Asia, and Latin America should take the responsibility of satisfying rural people's educational needs on knowledge that could help them acquire scientific consciousness and increase their productivity and gain freedom in decision-making. However, both groups remained undecided about whether the organization should be involved in satisfying the general and basic educational needs of rural people such as reading and writing.
6. Extension educators and international graduate students agreed that all twenty-eight training items were needed by international graduate students and important to be included in curricula intended for them.

Recommendations

Based on the findings and conclusions drawn from this study and observations made by the researcher while conducting the study, the following recommendations are made:

1. International graduate students of extension education should have an understanding of the processes and practices of the agricultural extension program. They should be provided with sufficient learning experiences in order to master these processes and practices. Special attention should be given to these processes and practices

related to the establishment of an institutional framework.

2. Agricultural extension organizations in Africa, Asia, and Latin America should be set up with primarily an educational philosophy and mission. National governments should permit the organization the necessary freedom to work in an educational rather than directive mode of operation.
3. The extension organization should be strongly oriented toward helping at the local level rather than satisfying government and national production goals; local participation especially in control and financing is strongly recommended.
4. It is recommended that the agricultural extension organizations in Africa, Asia, and Latin America should commit their resources and efforts to satisfy rural people's educational needs for knowledge that would help them acquire scientific consciousness, improve their farm productivity, improve their living and gain freedom in decision-making.
5. In implementing training programs for international graduate students of extension education, it is recommended that all twenty-eight training items studied be part of their study program. Higher means assigned by international graduate students on ten items of need and importance, and significant differences between the perceptions of the two groups, pointed out the need for tailoring education program more toward students' needs, interests, and aspirations.

Recommendations for Further Study

1. The findings of this study on policies and characteristics of the agricultural extension organizations suggested that there is much need for more extensive study of these policies and characteristics in more localized geographical areas. It is important to identify other, more detailed, and specific criteria and to determine how well these are related to the agricultural extension organizations in other places in the Third World countries. Regional or more localized studies are encouraged to be compared with the results of this study.
2. This study does not have the capacity to recommend a comprehensive proposal of a curriculum for international graduate students of extension education. Before doing that a comprehensive revision of the training items included in this study should be done and the perceptions of other groups should be investigated and compared to the findings of this study.
3. It is recommended that the data collected under this study be further analyzed to investigate possible associations and relationships between respondents' perceptions and their demographics. Possible analysis may focus on investigating difference in perceptions between experienced and inexperienced international graduate students, associations between perceptions of extension educators and international graduate students in the four regions of the United States, selection of particular philosophical views such as "top-down" vs. "bottom-up" and look for patterns in respondents' perceptions, etc.

Implications

Although it is safe to generalize the results and findings of this study to the target population, with the assumption that those who participated in the study were typical extension educators and international graduate students of extension education, the researcher, however, understands the inherent dangers in offering generalized recommendations to reform the agricultural extension organizations in any particular region. Anyone who is genuinely interested in extension education outside the United States could be a serious reader and benefit from the output of this study and work out his/her own applications of useful perceptions and adapt them to his/her specific situation.

Many international development organizations are involved in reforming the agricultural extension organizations in Africa, Asia, and Latin America. The majority of these reforms are characterized by prescribing a "ready-made" model or method to agricultural extension. National governments in Africa, Asia, and Latin America have been willing to install these models because they have been accompanied with enough easy money behind them. However, these proposed models were designed in a way to help the governments in these countries increase their exports from cash crops, which are not the farmers' crops.

It was a basic premise behind this study that replacing an existing model and method of extension education with another without trying to consider reforming the code of structure and operation of the extension organization will result only in limited success if not complete failure. International development organizations if genuinely interested in

helping countries in Africa, Asia, and Latin America improve their agricultural extension organizations should consider seriously changing their reforming strategies. The literature review, findings, and conclusions of this study supported the proposals presented by many scholars and called for adopting a holistic approach to reforming the organization. These approaches suggested revising the philosophy, mission, function, placement, orientation, and control of the extension organization. International development agencies should consider focusing their resources on doing a more in-depth study of the code of structure and operation of the agricultural extension organization under reform. This may provide an excellent alternative to the "ready-made" model approach to reforming the agricultural extension organization in the Third World.

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Special and sincere appreciation is extended to Dr. Larry D. Trede for serving on my committee as co-major professor and for his advice, suggestions and professional advice throughout the conduct of this investigation.

A sincere thanks is extended to Dr. David L. Williams for serving on my committee, and his professional advice, especially in developing the research instrument.

Very special thanks is extended to Dr. Mack C. Shelley for serving on my committee for his patience, kindness, and providing the professional advice during the development of the instrument and data analysis.

The researcher extends a very special, sincere thanks to Dr. Eric A. Abbott for serving on my committee, for his professional advice during the development of the instrument, his encouragement, and his friendship.

A very special thanks and appreciation is extended to Susan Lund for typing this dissertation.

This research is dedicate to my late mother, Batoul Mohamed, and to

my entire family in Sudan, to my wife Magda, and my son Basil. Their patience, understanding, encouragement, and love gave me the will and ability to complete my graduate program.

The researcher also wishes to extend special thanks and appreciation to the Sudanese Government, the World Bank Graduate Scholarship Program (WBGSP), and the Arab Student Aid International (ASAI) for their financial support throughout my graduate program at Iowa State University.

I am in debt to all extension educators and international graduate students of extension education who participated in this research and provided the requested information.

APPENDIX A: CORRESPONDENCE WITH THE DIRECTORS COOPERATIVE EXTENSION SERVICES

Iowa State University of Science and Technology Ames, Iowa 50011

Department of Agricultural Education
201 Curtiss Hall
Telephone: 515-294-5872

4/14/1992

Dear:

We need to identify the universities, colleges, or other educational institutions offering graduate programs in extension education in the U.S. for a research study that we are conducting at Iowa State University entitled "Extension Education As Perceived By Extension Educators And International Students of Extension Education in the United States." The results of this study could benefit:

(1) Educational institutions in the United States in better understanding the needs, interests and expectations of their international students.
(2) International students of extension in developing better plans of study in order to add to their skills and achieve their educational objectives.
(3) Planners, decision-makers in the Third World and in the development community in reflecting the thinking of the future leaders of the extension organization in the Third World nations.

Extension has been identified to be the best starting place for us in order to obtain the needed names and addresses in your state. Would you please complete and return the enclosed form by May 1, 1992. A self-addressed, stamped envelope has been included for your convenience. Your cooperation is highly appreciated.

Sincerely yours,

Julia Gamon

Julia A. Gamon
Associate Professor

Ismail E. Mohamed
Graduate Research Assistant

State:_____

_____ There is no institution in this state offering graduate programs in extension education.

_____ The following institutions offer graduate programs in extension education:

Name	Address	Phone
_____	_____ _____ _____ (Zip)	( )_____
_____	_____ _____ _____ (Zip)	( )_____
_____	_____ _____ _____ (Zip)	( )_____

* Please add a page if needed.

APPENDIX B. CORRESPONDENCE WITH THE SCHOOLS IN THE FRAME OF THE STUDY

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY 231

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-6924

September 1, 1992

Dear:

Many of us encounter problems when advising our graduate international students in extension education. We are conducting a research study entitled "Extension Education in the Third World: Perceptions by Extension Educators and International Students of Extension Education in Selected Universities in the United States". This study could benefit:

(1) Educational institutions in the United States in better understanding the needs, interests and expectations of their international students.

(2) International students of extension in developing better plans of study in order to add to their skills and achieve their educational objectives.

(3) Planners/decision-makers in the Third World and in the development community since this study will reflect the thinking of future leaders of extension in Third World nations.

The frame of this study includes 33 schools offering graduate programs in extension education. The target population of the study is comprised of two groups: 1) graduate students from the Third World countries interested in extension education and 2) extension educators in these 33 schools.

Your school has been identified to be one of these institutions of higher education in the United States which offer a graduate program in extension education. Would you please provide us with the names, addresses and phone numbers of your faculty members specializing in extension education and graduate international students with an interest in extension education (be sure to indicate nationality of the students). Please complete the enclosed forms and return them to us by September 25, 1992. Your cooperation is highly appreciated.

Sincerely yours,

Julia A. Gamon
Associate Professor

Ismail E. Mohamed
Graduate Student

Enclosures (2)

Numbers and addresses of extension educators at:
(school name).....

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____
_____ _____
phone number:_____ phone number:_____
****
Name: _____ Name:_____
Address: _____ Address: _____
_____ _____
_____ _____
phone number:_____ phone number:_____
****
Name: _____ Name: _____
Address:_____ Address: _____
_____ _____
_____ _____
phone number:_____ phone number:_____
****
Name: _____ Name: _____
Address: _____ Address: _____
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phone number:_____ phone number:_____
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Name: _____ Name: _____
Address: _____ Address: _____
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phone number:_____ phone number:_____
****
Name:_____ Name:_____
Address:_____ Address:_____
_____ _____
_____ _____
phone number:_____ phone number:_____
****
Name: _____ Name: _____
Address_____ Address: _____
_____ _____
_____ _____
phone number:_____ phone number:_____
****
Name: _____ Name: _____
Address:_____ Address:_____
_____ _____
_____ _____
phone number: _____ phone number:_____
****

Numbers and addresses of international graduate students interested in extension education at (school name).....

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____
_____ _____
Nationality: _____ Nationality: _____

****

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____
_____ _____
Nationality: _____ Nationality: _____

****

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____
_____ _____
Nationality: _____ Nationality: _____

****

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____
_____ _____
Nationality: _____ Nationality: _____

****

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____
_____ _____
Nationality: _____ Nationality: _____

****

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____
_____ _____
Nationality: _____ Nationality: _____

****

Name: _____ Name: _____
Address _____ Address: _____
_____ _____
_____ _____
Nationality: _____ Nationality: _____

****

Name: _____ Name: _____
Address: _____ Address: _____
_____ _____
_____ _____
Nationality: _____ Nationality: _____

****

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

234

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-6924

October 6, 1992

Dear

Last month, a questionnaire seeking the names and addresses of your extension education faculty and graduate international students was mailed to you. Your school has been identified as one of the institutions of higher education in the United States that offer a graduate program in extension. It has been selected for a census study titled *"Extension Education in the Third World: Perception by Extension Educators and International Students of Extension Education in Selected Universities in the United States"* that we are conducting at Iowa State University. The results of this study could benefit:

1. Educational institutions in the United States in better understanding the needs, interests and expectations of their international students.

2. International students of extension to develop better plans of study in order to add to their skills and achieve their educational objectives.

3. Planners, decision-makers in the Third World and in development community World nations in reflecting the thinking of the future leaders of the extension organization in the Third World nations.

The frame of this study includes 33 schools offering graduate programs in extension education. The target population of the study is comprised of two groups: 1) graduate students from the Third World countries majoring in extension education and 2) extension educators in these 33 schools.

If you have already provided us with the needed lists, please accept our sincere thanks. If not, please do so. We feel that your school contribution in this study is vital and essential. Enclosed are the two forms that we need you to complete and return. Your cooperation is highly appreciated.

Sincerely yours,

Julia A. Gamon
Associate Professor

Ismail E. Mohamed
Graduate Student

kmv

Enclosures

APPENDIX C. QUESTIONNAIRE AND COVER LETTER

Agricultural Extension in Africa, Asia and Latin America: Perceptions by Extension Educators and International Students of Extension Education in Selected Universities in the United States

Instructions

A number of selected statements about agricultural extension in Africa, Asia and Latin America are listed on the following pages. We are interested in your opinion about each statement. This survey instrument has five parts. Each part has its own instructions. Please read the instructions carefully and respond to all items in each of the parts. These statements are in no way designed to be a test. There are no right or wrong answers to the statements. The answers that will be the most helpful are the ones which best reflect your own opinion about each of the statements. May we take this opportunity to thank you in advance for your kind cooperation.

Department of Agricultural Education and Studies
Iowa State University
Ames, Iowa 50011

Date March 2, 1993

Dear Extension Educator/Extension Education Student:

We are writing to you about our national study at Iowa State University entitled "Agricultural Extension in Africa, Asia and Latin America: Perceptions By Extension Educators and International Students of Extension Education in the United States."

The large number of questionnaires returned is very encouraging. But, whether we will be able to describe accurately how educators and international students of extension feel about extension education depends upon you and others who have not yet responded. The results of this study could be of great use to the many extension educators and students.

Because of this reason, we are sending another questionnaire and urging you to complete and return it to us as quickly as possible. A self-addressed, stamped envelope is included for your convenience.

Please accept our sincere thanks and appreciation for your cooperation and the time you spend to complete this survey instrument.

Sincerely,

Julia A. Gamon
Associate Professor

Ismail E. Mohamed
Graduate Student

Part I

The following are statements that may or may not be related agricultural extension processes and practices. Would you please indicate how important each one of these statements is to you by circling the appropriate number:

1 Not Important — 2 Somewhat Important — 3 Important — 4 Very Important — 5 Extremely Important

The extension program planners in Africa, Asia and Latin America should be able to:

		NI	SI	I	VI	EI
1.	State clearly the philosophy of their extension program.	1	2	3	4	5
2.	Analyze situations, concern,s interests and needs of clients.	1	2	3	4	5
3.	Formulate realistic and meaningful program goals.	1	2	3	4	5
4.	Organize and utilize group participation methods during program implementation.	1	2	3	4	5
5.	Consider the national policy in preparing Extension Education programs.	1	2	3	4	5
6.	Design both an annual and long-range plan of work.	1	2	3	4	5
7.	Operate within the expected administrative framework.	1	2	3	4	5
8.	Assess the effects and outcomes of their extension programs.	1	2	3	4	5
9.	Utilize the results of program evaluation initiatives.	1	2	3	4	5
10.	Understand relationship among national and international institutions involved in agricultural knowledge system.	1	2	3	4	5
11.	Select and supervise staff.	1	2	3	4	5
12.	Use survey methods to seek information.	1	2	3	4	5
13.	Analyze and interpret data derived from a survey.	1	2	3	4	5
14.	Outline appropriate staff recruitment plans.	1	2	3	4	5
15.	Utilize computers for word processing and data analysis.	1	2	3	4	5

Part II

A number of statements about principles, concepts, responsibilities, characteristics, and selected policies of the Extension Organization are listed below. Please indicate your level of the agreement/disagreement with each one by circling the appropriate number:

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly agree

The Extension Organization in Africa, Asia and Latin America should:

		SD	D	U	A	SA
1.	Have a clearly stated educational philosophy.	1	2	3	4	5
2.	Have a clearly stated educational mission.	1	2	3	4	5
3.	Derive its mission from the national policies.	1	2	3	4	5
4.	Function according to its own philosophy.	1	2	3	4	5
5.	Enforce the government's production goals.	1	2	3	4	5
6.	Have priorities:					
	(a) Based on the national policies.	1	2	3	4	5
	(b) Based on research findings.	1	2	3	4	5
	(c) Based on the numbers of farmers affected.	1	2	3	4	5
	(d) Based on availability of human resources.	1	2	3	4	5
7.	Be within:					
	(a) The Ministry of Agriculture.	1	2	3	4	5
	(b) The Ministry of Education.	1	2	3	4	5
	(c) University (e.g., College of Agriculture).	1	2	3	4	5
8.	Be involved:					
	(a) In educational duties.	1	2	3	4	5
	(b) In both educational and noneducational duties (such as distributing inputs/loans).	1	2	3	4	5

(Part II Continued)

The Extension Organization in Africa, Asia and Latin America should:

1 Strongly Disagree — 2 Disagree — 3 Undecided — 4 Agree — 5 Strongly agree

	SD	D	U	A	SA
9. Use the following type of program development:					
(a) "Top-down" (i.e., someone at the top of the administrative hierarchy proposes the major ideas).	1	2	3	4	5
(b) "Bottom-up (i.e., someone at the lowest level of the organization comes up with an idea and passes it through the organization as a means of program determination).	1	2	3	4	5
10. Operate under policies established by:					
(a) The sponsor (e.g., Ministry of Agriculture).	1	2	3	4	5
(b) The clientele (e.g., small farmers).	1	2	3	4	5
(c) The international agencies (e.g., The World Bank).	1	2	3	4	5
(d) Both the sponsor and the clientele.	1	2	3	4	5
(e) Both the sponsor and the international organization.	1	2	3	4	5
(f) A combination of the sponsor, the client, and the international agencies.	1	2	3	4	5
11. Be funded by:					
(a) The central government.	1	2	3	4	5
(b) Local sources (e.g., regions/districts).	1	2	3	4	5
(c) Combination of central government and local sources.	1	2	3	4	5
12. Focus on technology (recommendation from research).	1	2	3	4	5
13. Focus on increasing the capacity of the people (empowering people).	1	2	3	4	5

Part III

The following are some of the educational needs of rural people directly engaged in agriculture that could be fulfilled by the extension organization. Would you please indicate your level of agreement or disagreement regarding what the agricultural extension organization in Africa, Asia and Latin America ought to fulfill of these educational needs by circling the appropriate number:

1 Strongly Disagree — 2 Disagree — 3 Undecided — 4 Agree — 5 Strongly agree

		SD	D	U	A	SA
1.	General or basic education (e.g., reading, writing).	1	2	3	4	5
2.	Application of new inputs: varieties, improved farm practices, etc.	1	2	3	4	5
3.	Application of new and improved practices related to livestock.	1	2	3	4	5
4.	Food storage, processing, and preservation.	1	2	3	4	5
5.	Knowledge and skills for family improvement (e.g., health care, nutrition, home economics child care, family planning.	1	2	3	4	5
6.	Civic skills (e.g., knowledge of how cooperatives local government, and national government function).	1	2	3	4	5
7.	Supplementary skills for farm maintenance and improvement.	1	2	3	4	5
8.	Farm business management.	1	2	3	4	5

Part IV

In order to master the extension practices and processes indicated in Part I, international graduate students in extension education should possess certain knowledge and be able to perform specific skills. Each item in this section states a topic that is related to specific competency or skill which may or may not be important for international graduate students of extension education.

International Student: Please circle the number which best describes your perception of your Need for training/additional information for each item at the time when you started your graduate program in the United States. Also circle the number which best expresses your feeling about the Importance of the item being included in the curriculum of study for an extension graduate.

Extension Educator: Please circle the number which best describes your feeling about your international extension graduates' Need for training/additional information for each of these items. Also circle the number which best expresses your feeling about the Importance of each item in a curriculum for an international extension graduate.

Not Needed (1) — Somewhat Needed (2) — Needed (3) — Very Much Needed (4) — Extremely Needed (5)

Not Important (1) — Somewhat Important (2) — Important (3) — Very Important (4) — Extremely Important (5)

Need						Importance				
NN	SN	N	VMN	EN		NI	SI	I	VI	EI
1	2	3	4	5	(1) Research methodology	1	2	3	4	5
1	2	3	4	5	(2) Statistical methods	1	2	3	4	5
1	2	3	4	5	(3) Program evaluation	1	2	3	4	5
1	2	3	4	5	(4) Administration	1	2	3	4	5
1	2	3	4	5	(5) Program planning	1	2	3	4	5
1	2	3	4	5	(6) Teaching methods	1	2	3	4	5
1	2	3	4	5	(7) Adult learning theories	1	2	3	4	5
1	2	3	4	5	(8) Staff development	1	2	3	4	5
1	2	3	4	5	(9) Youth program management	1	2	3	4	5
1	2	3	4	5	(10) Organizing presentation and media selection	1	2	3	4	5
1	2	3	4	5	(11) Agricultural extension in the Third World countries	1	2	3	4	5
1	2	3	4	5	(12) Curriculum development	1	2	3	4	5
1	2	3	4	5	(13) Philosophy of agricultural extension and education	1	2	3	4	5

(Part IV Continued)

Not Needed	Somewhat Needed	Needed	Very Much Needed	Extremely Needed
1	2	3	4	5
Not Important	Somewhat Important	Important	Very Important	Extremely Important

Need						Importance				
NN	SN	N	VMN	EN		NI	SI	I	VI	EI
1	2	3	4	5	(14) Leadership	1	2	3	4	5
1	2	3	4	5	(15) Implementing international and rural development programs	1	2	3	4	5
1	2	3	4	5	(16) Major world food issues	1	2	3	4	5
1	2	3	4	5	(17) Impact of technology on family	1	2	3	4	5
1	2	3	4	5	(18) Diffusion and adoption of innovations	1	2	3	4	5
1	2	3	4	5	(19) Rural community development issues	1	2	3	4	5
1	2	3	4	5	(20) Application of computer in educational settings	1	2	3	4	5
1	2	3	4	5	(21) Concepts and theories in rural sociology	1	2	3	4	5
1	2	3	4	5	(22) Communication theories and methods	1	2	3	4	5
1	2	3	4	5	(23) Technology and social change in the Third World countries	1	2	3	4	5
1	2	3	4	5	(24) Needs assessment	1	2	3	4	5
1	2	3	4	5	(25) Internship in cooperative extension	1	2	3	4	5
1	2	3	4	5	(26) Critical thinking	1	2	3	4	5
1	2	3	4	5	(27) Human behavior	1	2	3	4	5
1	2	3	4	5	(28) History of the cooperative extension	1	2	3	4	5
					(29) Others (Please list and rate):					
1	2	3	4	5	_____	1	2	3	4	5
1	2	3	4	5	_____	1	2	3	4	5
1	2	3	4	5	_____	1	2	3	4	5
1	2	3	4	5	_____	1	2	3	4	5
1	2	3	4	5	_____	1	2	3	4	5

Part V: (For International students)

Please complete the following information:

1. What is your home country? _____

2. What institution are you attending? _____

3. What program are you in? ( ) Master's ( ) Doctorate

4. How many years have you been studying in the United States? ___

5. Where did you get your previous degree(s), and in what major?

   Bachelor in _____ ( ) U.S. School
   ( ) Non U.S. School

   Master in _____ ( ) U.S. School
   ( ) Non U.S. School

6. Have you had any work experience in extension education in your country?

   ( ) Yes ( ) No

7. Have you had any work experience in extension education in the United States?

   ( ) Yes ( ) No

   If Yes, how long? _____ years

8. Age: _____

9. Sex: ( ) Male ( ) Female

Part V: (For Extension Educators)

Please complete the following information:

1. Present academic rank: _____

2. Name of your institution: _____

3. Total work experience: _____

4. Years of work experience in extension education? _____

5. Years of teaching extension education courses? _____

6. International experience which was acquired outside the United States?
   ( ) None
   ( ) Less than one year
   ( ) 1-5 years
   ( ) More than 5 years

8. Age: _____

9. Sex: ( ) Male ( ) Female

Do you have additional comments that would help us better understand your view on international extension education? If yes, please use the space below to share your thoughts with us.

APPENDIX D. FOLLOW-UP CORRESPONDENCE

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

247

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-6924

Date: March 1,1993

Dear Extension Educator/Extension Education Student:

We are writing to you about our national study at Iowa State University entitled "Agricultural Extension in Africa, Asia and Latin America: Perceptions by Extension Educators and International Students of Extension Education in the United States".

The large number of questionnaire returned is very encouraging. But, whether we will be able to describe accurately how educators and international students of extension feel about extension education depends upon you and others who have not yet responded. The findings of this study could be of great help to many extension educators and students.

Because of this reasons, we are sending another questionnaire and urging you to complete and return to us as quickly as possible. A self-addressed stamped envelope is included for your convenience. Please accept our sincere thanks and appreciation for your cooperation and the time you spend to complete this survey instrument.
Sincerely yours;

Julia A. Gamon
Associate Professor

Ismail E. Mohamed
Graduate Student

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

248

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201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294-5904
Research and Extension Programs 515 294-5872
Undergraduate Programs 515 294-0924

4.12.1993

Dear Extension Educator/Extension Education Student:

Last month we mailed copies of our survey instrument asking your perceptions toward agricultural extension in Africa, Asia and Latin America. However, it may be that in your busy schedule you have not found the time to complete the form.

The response to this survey has been excellent. But, whether we will be able to describe accurately how extension educators and international students of extension education feel about extension education depends upon you and others who have not responded. The results of this study could be of great use to the many extension educators and students.

Because of these reasons, we are sending another questionnaire and urging you to take a few minutes and complete only the highlighted questions in each of the five parts of the survey and return it to us as soon as possible. A self-addressed stamped envelop is included for your convenience. Your responses to these questions are needed to compare to those of the ones who completed and returned the survey form to us.

Please accept our sincere thanks and appreciations for your cooperation and the time you spent to complete these questions.

Julia Gamon

Julia A. Gamon
Associate Professor

Ismail E. Mohamed
Graduate Student

APPENDIX E. T-TEST FOR COMPARISON BETWEEN RESPONDENTS AND NONRESPONDENTS

Table 47. T-test of the respondents/nonrespondents on the agriculture extension program processes and practices items

Agricultural extension program processes and practices	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	probability[a]
The extension program planners in Africa, Asia, and Latin America should be able to:				
State clearly the philosophy of their extension program.	4.48 0.83	4.43 0.79	.17	.863
Analyze situations, concerns, interests and needs of clients.	4.76 0.52	4.29 0.76	1.65	.149
Organize and utilize group participation methods during program implementation.	4.23 0.80	4.00 0.82	-.53	.598
Consider the national policy in preparing extension education programs.	3.94 0.93	3.86 0.90	.24	.810
Design both an annual and long-range plan of work.	4.18 0.85	4.00 0.82	.54	.590
Operate within the expected administrative framework	3.61 0.94	3.43 0.98	.51	.612
Assess the effects and outcomes of their extension programs	4.46 0.68	4.43 0.79	.13	.900

Utilize the results of program evaluation initiatives.	4.37 0.72	4.14 1.07	.79	.429
Understand relationship among national and international institutions involved in agricultural knowledge system.	3.71 0.96	3.71 1.11	-.02	.987
Select and supervise staff.	3.77 0.97	4.00 0.82	-.61	.541
Use survey methods to seek information.	3.44 1.04	3.29 0.95	.39	.700
Analyze and interpret data derived from a survey.	3.76 1.06	3.71 0.76	.10	.921
Outline appropriate staff recruitment plans.	3.53 1.02	3.29 0.49	.62	.538
Utilize computers for word processing and data analysis	3.18 1.15	2.86 1.07	.74	.460

[a]Not significant at α = 0.05 and 0.001.

Table 48. T-test of the respondents/nonrespondents on the selected policies and characteristics of agricultural extension organizations

Policies and characteristics	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	probability[a]
The Extension Organization in Africa, Asia, and Latin America should:				
Have a clearly stated educational philosophy.	4.42 0.87	4.63 0.52	-.65	.519
Have a clearly stated educational mission.	4.48 0.84	4.63 0.52	-.47	.638
Derive its mission from the national policies.	3.74 0.99	3.38 0.74	1.03	.307
Function according to its own philosophy.	3.85 0.97	3.50 1.31	.99	.326
Enforce the governments' production goals.	2.81 1.19	3.25 1.04	-1.02	.307
Have priorities based on national policies.	3.51 1.02	3.75 0.89	-.66	.508
Have priorities based on research findings.	4.17 0.89	4.12 0.64	.13	.896
Have priorities based on the numbers of farmers affected.	3.98 0.95	4.00 1.07	-.06	.956

Have priorities based on availability of human resources.	4.03 0.78	3.86 0.69	.56	.578
Be within the Ministry of Agriculture.	3.56 1.19	3.71 1.11	-.34	.735
Be within the Ministry of Education.	2.55 1.82	2.88 1.12	.76	.449
Be within University (e.g., College of Agriculture.	3.92 1.09	3.75 1.04	.43	.665
Be involved in educational duties.	4.32 0.89	4.00 1.41	.96	.336
Be involved in educational and non-educational duties (such as distribution of inputs/loans).	2.89 1.30	3.63 1.19	-1.57	.117
Use a "top down" (i.e., someone at the top of the administrative hierarchy propose the major ideas) type of program development.	2.10 1.18	2.13 1.36	-.05	.957
Use a "bottom-up" (i.e., someone at the lowest level of the organization comes up with an idea and passes it through the organization as a means of program determination) type of program development.	4.09 0.94	3.57 1.27	1.43	.155
Operate under policies established by the sponsor (e.g., Ministry of Agriculture).	3.24 1.15	3.29 1.11	-.11	.915

Table 48. Continued

Policies and characteristics	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	probability[a]
The Extension Organization in Africa, Asia, and Latin America should:				
Operate under policies established by the clientele (e.g., small farmers).	3.74 1.16	3.71 1.38	.04	.966
Operate under policies established by international agencies (e.g., the World Bank).	2.51 1.12	2.57 1.27	-.15	.881
Operate under policies established by both the sponsor and the clientele.	3.99 1.07	3.71 1.49	.65	.519
Operate under policies established by both the sponsor and the international agencies.	2.89 1.18	3.37 1.41	-1.13	.262
Operate under policies established by a combination of the sponsor, the clientele, and the international agencies.	4.00 1.05	4.28 0.76	-.69	.489
Be funded by the central government.	3.54 0.99	3.85 0.69	-.84	.403

Be funded by local sources (e.g., regions/districts).	3.53 0.89	3.62 0.92	-.30	.766
Be funded by combination of central government and local sources.	4.48 0.76	4.38 0.74	.39	.700
Focus on technology (recommendation from research).	3.75 1.06	3.87 1.13	-.31	.755
Focus on increasing the capacity of the people (empowering people).	4.54 0.73	4.25 1.04	1.07	.288

[a]Not significant at $\alpha = 0.05$ and 0.001.

Table 49. T-test of the respondents/nonrespondents on the educational needs of rural people items

Educational needs of rural people	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	α-tail probability[a]
General or basic education (e.g., reading, writing)	3.17 1.25	3.50 1.07	-.73	.468
Application of new inputs; varieties, improved farm practices, etc.	4.44 0.70	4.62 0.52	-.74	.462
Applications of new and improved practices related to livestock	4.39 0.74	4.63 0.52	-.89	.374
Food storage, processing, and preservation	4.48 0.64	4.25 0.71	.98	.327
Knowledge and skills for family improvement (e.g., health care, nutrition, home economics, child care, family planning)	4.47 0.75	4.75 0.46	-1.07	.288
Civic skills (e.g., knowledge of how cooperatives, local governments, and national governments function)	4.10 0.86	4.13 0.64	-.07	.942
Supplementary skills for farm maintenance and improvement	4.31 0.63	4.13 0.99	.77	.442
Farm business management	4.45 0.60	4.29 1.11	.66	.511

[a]Not significant at α = 0.05 and 0.001.

Table 50. T-test of the respondents/nonrespondents on the need for 28 training items be included in a curriculum for international graduate students

Selected skills and training items	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	α-tail probability[a]
Research methodology	4.09 / 0.87	4.00 / 0.82	.28	.779
Statistical methods	3.75 / 0.96	3.57 / 0.98	.48	.632
Program evaluation	4.52 / 0.68	4.29 / 0.95	.88	.378
Administration	3.77 / 0.94	4.00 / 0.82	-.65	.517
Program planning	4.57 / 0.61	4.29 / 0.76	1.19	.237
Teaching methods	4.29 / 0.86	4.14 / 0.90	.44	.661
Adult learning theories	4.05 / 0.94	3.57 / 1.27	1.31	.192
Staff development	3.79 / 0.93	4.14 / 0.69	-.99	.324
Youth program management	3.71 / 0.94	3.29 / 1.49	1.12	.265
Organizing presentation and media selection	3.89 / 0.91	3.71 / 1.11	.47	.642
Agricultural extension in the Third World countries	3.97 / 1.03	3.71 / 1.38	.64	.523
Curriculum development	3.85 / 0.98	3.43 / 1.34	1.11	.269

Table 50. Continued

Selected skills and training items	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	α-tail probability[a]
Philosophy of agricultural extension and education	3.91 0.98	4.00 1.00	-.25	.804
Leadership	4.11 0.88	3.71 1.49	.69††	.514
Implementing international and rural development programs	4.11 0.88	4.10 0.92	.04	.967
Major world food issues	3.50 0.94	3.43 0.98	.20	.845
Impact of technology on family	3.58 0.99	3.71 1.11	-.35	.728
Diffusion and adoption of innovations	4.27 0.87	3.86 0.90	1.21	.227
Rural community development issues	4.14 0.87	4.14 1.07	-.01	.993
Application of computer in educational settings	3.29 1.08	3.57 1.27	-.66	.511
Concepts and theories in rural sociology	3.71 0.98	3.57 1.13	.35	.726
Communication theories	4.14 0.77	3.57 0.98	1.88	.063
Technology and social change in the Third World countries	3.91 0.93	3.86 1.22	.14	.892
Needs assessment	4.41 0.72	4.00 1.00	1.47	.145

Table 50. Continued

Selected skills and training items	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	α-tail probability[a]
Internship in Cooperative extension	3.70 1.12	4.14 1.22	-1.02	.308
Critical thinking	3.97 1.00	4.14 1.07	-.45	.652
Human behavior	3.87 0.96	3.71 1.25	.42	.674
History of Cooperative extension	2.83 1.16	2.71 1.25	.25	.803

††Separate variance estimate.

[a]Not significant at α = 0.05 and 0.001.

Table 51. T-test of the respondents/nonrespondents on the importance of 28 training items be included in a curriculum for international graduate students

Selected skills and training items	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	α-tail probability[a]
Research methodology	4.15 0.92	3.88 0.64	.85	.397
Statistical methods	3.71 0.97	3.50 1.07	.59	.555
Program evaluation	4.53 0.66	4.25 0.71	1.17	.245
Administration	3.74 0.94	3.75 0.46	-.04††	.965
Program planning	4.63 0.57	4.25 0.89	1.21††	.263
Teaching methods	4.36 0.78	4.38 0.92	-.04	.968
Adult learning theories	4.14 0.86	3.75 1.16	1.23	.221
Staff development	3.81 0.91	3.63 0.74	.55	.581
Youth program management	3.69 0.94	3.50 1.41	.55	.586
Organizing presentation and media selection	3.82 0.87	3.63 1.06	.61	.544
Agricultural extension in the Third World countries	4.07 1.00	3.63 1.18	1.20	.233
Curriculum development	3.89 1.00	3.75 1.04	.39	.701

Table 51. Continued

Selected skills and training items	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	α-tail probability[a]
Philosophy of agricultural extension and education	3.99 0.97	4.13 0.99	-.37	.709
Leadership	4.22 0.83	3.75 1.39	.94††	.376
Implementing international and rural development programs	4.10 0.92	3.88 0.84	.68	.498
Major world food issues	3.61 0.97	3.75 1.17	-.39	.695
Impact of technology on family	3.63 1.01	3.50 1.07	.34	.733
Diffusion and adoption of innovations	4.26 0.88	4.13 0.84	.42	.677
Rural community development issues	4.26 0.83	4.37 0.74	-.39	.696
Application of computer in educational settings	3.30 1.12	3.50 1.31	-.50	.619
Concepts and theories in rural sociology	3.63 0.97	3.50 1.20	.37	.710
Communication theories theories	4.11 0.87	3.88 1.13	.74	.462
Technology and social change in the Third World Countries	4.01 0.86	3.88 1.13	.42	.677

Table 51. Continued

Selected skills and training items	Respondents (n=159) Mean S.D.	Nonrespondents (n=8) Mean S.D.	T-value	α-tail probability[a]
Needs assessment	4.48 0.70	4.25 0.89	.89	.375
Internship in Cooperative extension	3.72 1.04	3.88 1.13	-.40	.688
Critical thinking	4.03 1.00	4.13	-.25	.801
Human behavior	3.85 0.99	4.00 0.93	-.43	.665
History of Cooperative extension	2.77 1.17	2.63 0.92	.35	.727

††Separate variance estimate.

[a]Not significant at α = 0.05 and 0.001.

APPENDIX F. HUMAN SUBJECT APPROVAL FORM

Last Name of Principal Investigator MOHAMED

Checklist for Attachments and Time Schedule

The following are attached (please check):

12.[X] Letter or written statement to subjects indicating clearly:
- a) purpose of the research
- b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
- c) an estimate of time needed for participation in the research and the place
- d) if applicable, location of the research activity
- e) how you will ensure confidentiality
- f) in a longitudinal study, note when and how you will contact subjects later
- g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13.[ ] Consent form (if applicable)

14.[ ] Letter of approval for research from cooperating organizations or institutions (if applicable)

15.[X] Data-gathering instruments

16. Anticipated dates for contact with subjects:

First Contact	Last Contact
12/20/1992	3/20/1993
Month / Day / Year	Month / Day / Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

5/30/1993
Month / Day / Year

18. Signature of Departmental Executive Officer | Date | Department or Administrative Unit

Richard Clarke | 12-1-92 | Ag Ed S

19. Decision of the University Human Subjects Review Committee:

[X] Project Approved ___ Project Not Approved ___ No Action Required

Patricia M. Keith | 12/3/92 | PMKeith

Name of Committee Chairperson | Date | Signature of Committee Chairperson